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NEW OR NOTEWORTHY PHILIPPINE ORCHIDS, III

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TWENTY-EIGHT PLATES

The third paper of this series is essentially like its predecessors, the last number of which was published in February, 1932.¹ The present paper contains the descriptions of six hitherto undescribed species and one variety, with notes and redescriptions of *Dendrochilum Weberi*, *Gastrochilus calceolaris*, and *Microsaccus Wenzelii*, as well as a record and description of one species (*Cymbidium pubescens*) previously described from extra-Philippine material now found for the first time in the Archipelago. All the illustrations and the descriptions in the text have been prepared from living plants. The colored illustrations and ink sketches were made by Messrs. J. M. Salazar and P. Ramos, draftsmen of the division of botany, Bureau of Science. Plates 11 and 12 were executed by F. Guerrero, a draftsman of the same division. All the types of the new species and varieties have been deposited in the herbarium of the Bureau of Science, with the isotypes in the herbarium of the senior author. Available isotypes will be distributed to the herbarium of the New York Botanical Garden and other herbaria.

¹ Philip. Journ. Sci. 47 (1932) 197.

Genus COELOGYNE Lindley

COELOGYNE REMEDIOSAE sp. nov. § Flexuosae. Plates 1, 3, and 14.

Radices glabrae, plus minusve 2 mm in diametro, carnosae et pallidae ut videtur. Rhizoma 8 ad 10 mm in diametro. Pseudobulbi in serie, anguste cylindracei, 11 ad 13 cm longi, 2 ad 2.7 cm in crassitudine infra medium, utrinque attenuati, diphylli, in rhizomate crasso repenti 2 ad 3 cm inter se distantes; juniores vaginis membranaceis, obtusis vel acutis, usque ad 7 cm longis vestiti. Folia cum petiolo 22.5 ad 26 cm longa, 5.5 ad 8.5 cm lata, elliptico-oblonga vel elliptica, breviter acuminata, subtus prominenter quinquenervia. Scapus initio foliis juvenilibus synanthus, 23 ad 31.5 cm longus, basi nuda, pauciflorus; rhachis gracilis, erecta vel arcuata. Bractee inflorescentiae ignotae. Flores succedanei. Pedicellus cum ovario circiter 1.5 cm longus. Sepala lateralia oblonga, abrupte acuta vel subacuta, 2.5 ad 2.9 cm longa, 1.0 ad 1.3 cm lata, subcarnosa. Sepalum dorsale oblongo-lanceolatum, acutum, 2 ad 2.2 cm longum, 0.8 ad 1.0 cm latum. Petala linearia, obtusa, apice obliquo apiculata, 2.5 ad 2.6 cm longa, 2.5 ad 3 mm lata, erecta. Labellum subcarnosum, trilobatum, circiter 2.5 cm longum; lobis laterales breves, subquadrati, apice valde obtusati vel rotundati, parte libera circiter 3 mm longa; lobus intermedius in circuitu suborbicularis, circiter 1.5 cm longus, 1.5 cm latus, apice subrotundatus, minute apiculatus, margine undulato; discus carinis 2, antice altis ornatus, ad basim 5-carinatus. Columna valde arcuata, carnosa, circiter 1.8 cm longa, apicem versus alata.

Roots glabrous, fibrous, about 2 mm in diameter, straw-colored. Rhizomes creeping, 8 to 10 mm in diameter. Pseudobulbs in linear series, narrowly cylindric, 11 to 13 cm high, 2 to 2.7 cm in diameter, tapering at both ends, diphyllous, 2 to 3 cm distant. Sheaths membranaceous, obtuse or acute, up to 7 cm long. Leaves with petiole 22.5 to 26 cm long, 5.5 to 8.5 cm wide, elliptic-oblong or elliptic, acute, conspicuously 5-nerved beneath. Scapes terminal, arising between the leaves of the immature pseudobulbs, the base naked, few-flowered, 23 to 31.5 cm long; rachis slender, erect or curved at the top. Bracts of the inflorescence early deciduous, not seen. Flowers odorless, produced in succession. Pedicellate ovary about 1.5 cm long, the ovary ridged. Lateral sepals oblong, abruptly acute or subacute, 2.5 to 2.9 cm long, 1.0 to 1.3 cm wide, somewhat fleshy. Dorsal sepal oblong-lanceolate, acute, 2 to 2.2 cm long, 0.8 to 1.0 cm wide. Petals linear, obtuse, minutely apiculate at the oblique

apex, erect, 2.5 to 2.6 cm long, 2.5 to 3 mm wide. Labellum somewhat fleshy, trilobed, about 2.5 cm long; lateral lobes rather short, subquadrate, the apex broadly obtuse or rounded, free portion about 3 mm long; middle lobe suborbicular, about 1.5 cm long, 1.5 cm wide, apex subrounded with a minute apicule, the margin undulate; disc with 5 low keels at the base, two of the keels increasingly high, conspicuous and wavy toward the apex, extended to one-third or one-half of the middle lobe; the 3 short basal keels 3 to 3.5 mm long. Column about 1.8 cm long, arcuate, fleshy, conspicuously winged at the apex.

LUZON, Manila, cultivated in the gardens of Mrs. Remedios C. Gonzales, *Bur. Sci.* 82232 Quisumbing, February 24, 1931. The plants flowered again a month earlier in Mrs. Gonzales's gardens this year (1932). The living plants, purchased from a peddler, were of uncertain origin but they were surely Philippine. The sepals are sea-foam yellow and deep sea-foam green at the middle; the petals are sea-foam green; column glass green, the apical margin pale grass green; the labellum marguerite yellow except the lamellæ, lateral lobes and the markings at the center of the middle lobe snuff brown.¹

Among the known Philippine coelogynes, this species appears most closely related to *C. marmorata* Reichb. f., but differs in its longer scape and in the keels of the lip. In habit it suggests *C. bilamellata* Lindl., *C. candonensis* Ames and *C. longirachis* Ames, but it has much larger flowers and a dissimilar lip.

Genus DENDROCHILUM Blume

DENDROCHILUM WEBERI Ames § Eudendrochilum. Plates 1, 4, and 15.

Dendrochilum Weberi AMES in Philip. Journ. Sci. 8 (1913) Bot. 410, Orch. 5 (1915) 65.

Rhizoma elongatum, repens, gracile, 2 ad 2.5 mm in diametro, ad nodos radicans. Pseudobulbi anguste cylindracei, 2 ad 3 cm longi, 2 ad 5.5 cm distantes. Folia breviter petiolata, coriacea, oblongo-lanceolata vel peranguste elliptica, in sicco nervosa, 7 ad 8.5 cm longa, 1 ad 2 cm lata, utrinque attenuata, ad apicem acuta. Scapus lateralis in basi pseudobulbi, plus minusve foliis longior, 8 ad 11 cm longus, gracilis, flexuosus vel pendulus, ad basim vaginis tubularibus bracteiformibus inclusus; bracteis inflorescentiæ glabris, lanceolatis, usque ad 2 mm longis. Flores in

¹ The color terms used are mostly from Ridgway's Color Standards and Color Nomenclature (1912).

racemis laxis dispositi. Sepala lateralalia lineari-lanceolata, subacuta, circiter 5 mm longa, 1.25 mm lata, 3-nervia, levissime falcata. Sepalum dorsale lineari-lanceolatum, acutum, circiter 5 mm longum, 1.5 mm latum, 3-nervium. Petala lineari-oblancoolata, obtusa vel acuta, circiter 4 mm longa, 1 mm lata, 1-nervia. Labellum obovato-oblongum, medio utrinque leviter angustatum, ad apicem late rotundatum vel retusum, circiter 2 mm longum, 1 mm latum, 3-nervium, ad basim bicallosum; pars inferior abrupte reflexa. Columna brevis, ad apicem trilobatam dente medio bidentato, dentibus lateralibus erectis, triangularilineribus. Pollinia quatuor.

Rhizomes creeping, elongated, slender, 2 to 2.5 mm in diameter, copiously rooting at the nodes. Roots fibrous, branching. Pseudobulbs narrowly cylindric, 2 to 3 cm long, rugose when dry, 2 to 5.5 cm apart. Leaves shortly petioled, coriaceous, oblong-lanceolate or very narrowly elliptic, 7 to 8.5 cm long, 1 to 2 cm wide, tapering at both ends, the apex acute; petioles 2 to 4 mm long. Scapes commonly longer than the leaves, 8 to 11 cm long, slender, flexuose or pendant, arising from the base of the pseudobulbs, sheathed at base with several tubular bracts. Bracts subtending the flowers lanceolate, acute, concave, up to 2 mm long. Flowers marguerite yellow, laxly disposed on the racemes. Lateral sepals linear-lanceolate, subacute, about 5 mm long, 1.25 mm wide, 3-nerved, slightly falcate. Dorsal sepal linear-lanceolate, acute, about 5 mm long, 1.5 mm wide, 3-nerved. Petals linear-oblancoolate, obtuse or acute, about 4 mm long, 1 mm wide, 1-nerved. Labellum glabrous, obovate-oblong, in the middle on each side slightly narrowed, reflexed at the base, about 2 mm long, 1 mm wide, broadly rounded or retuse at the apex, the base subhastate and bicallose, 3-nerved. Column very short, arcuate, at the apex trilobed, the middle tooth bidentate, the lateral arms triangular-linear and suberect. Pollinia 4.

LUZON, Manila, Bureau of Science orchid house, *Bur. Sci.* 84546 *Quisumbing*, May 19, 1931. The living plants were collected by Messrs. M. Ramos and P. Convozar from near the banks of Camahalan River, Agusan Province, Mindanao, growing on rocks, April 30, 1931. Living specimens are now growing on the tuff (Guadalupe stone) walls in the Bureau of Science orchid house in Manila.

This is the third collection of this species. In general habit it very closely resembles *D. aurantiacum* Blume, but differs in the details of the flowers.

Genus AGROSTOPHYLLUM Blume

AGROSTOPHYLLUM SACCATILABIUM sp. nov. Plates 1, 5, 16, and 17.

Aff. *A. inocephalum* (Schauer) Ames. Planta glabra, ad basim foliis disscissis, nuda, supra foliosa, 32 ad 45 cm alta. Caules complanati, vaginis foliorum tecti. Folia disticha, anguste lineari-oblonga; lamina 12 ad 17 cm longa, 2 ad 3 cm lata, in sicco subcoriacea, obtusa; vaginae foliorum imbricatae, persistentes, flavidae et atromarginatae, longivaginantae, usque ad 5 cm longae. Inflorescentiae terminalis, densissime capitata, usque ad 3.5 cm in diametro. Flores albidii, parvi, in racemis paucifloris numerosissimis capitulum formantes, bracteis imbricatis subtendentibus, 4 ad 6 mm in diametro. Sepala lateralia carinata, cucullata, ovato-oblonga, subacuta, circiter 4 mm longa, 2 mm lata, 3-nervia. Sepalum dorsale ovatum, subacutum, 3-nervium, circiter 3.5 mm longum, 2.25 mm latum. Petala lineari-lanceolata, apice ipso paulo ampliata, circiter 3.5 mm longa, 0.75 mm lata. Labellum saccatum, in circuitu suborbiculare; parte inferiore (hypochilio) semiorbiculari, saccata, circiter 1.5 mm longa; parte terminali (epichilio) valde saccata, semiorbiculari, ad apicem rotundata, circiter 2.5 mm longa; callus transversus. Columna crassa, circiter 2 mm longa. Pollinia 8.

A glabrous epiphyte, rather stout, 32 to 45 cm high; stems tufted, flattened, narrowed at the base. Leaves restricted to the upper portion of the stems, distichous, jointed with persistent clasping rigid bases; lamina 12 to 17 cm long, 2 to 3 cm wide, narrowly linear-oblong, obtuse, when dry subcoriaceous; sheaths up to 5 cm long. Inflorescences terminal, capitate, pluribracteate, up to 3.5 cm in diameter. Flowers very numerous, in few-flowered racemes, very crowded, marguerite yellow, 4 to 6 mm across. Lateral sepals carinate, cucullate, ovate-oblong, subacute, about 4 mm long, 2 mm wide, 3-nerved, the two side nerves not reaching the apex. Dorsal sepal ovate, subacute, about 3.5 mm long, 2.25 mm wide, 3-nerved. Petals linear-lanceolate, about 3.5 mm long, 0.75 mm wide. Labellum saccate, suborbicular in outline, about 3 mm long; hypochile semiorbicular, saccate, about 1.5 mm long, separated from the epichile by a transverse callus; epichile saccate, semiorbicular, the apex broadly rounded, about 2.5 mm long. Column stout, about 2 mm long. Pollinia 8.

LUZON, Benguet Subprovince, Baguio, Gardens of the Mansion House, *Bur. Sci.* 82229 *Quisumbing*, May 6, 1931. The living plants were first seen in the gardens of the Mansion House at

Baguio; the origin of the specimens is not known, but we are assured that the orchid peddlers in Baguio collected them from the mountains in the vicinity of Baguio.

A species closely allied to *Agrostophyllum inocephalum* (Schauer) Ames, but differing radically in the shape of the epichile.

Genus DENDROBIUM Swartz

DENDROBIUM AURICULATUM sp. nov. Plates 1, 6, and 18.

Aff. *D. papilio*. Caulibus simplicibus, basibus foliorum auriculatis, floribus albidis et basi auriculata labelli plus ovati differt.

Stems numerous, crowded in a clump, 30 to 82 cm high, erect or suberect, not branched, terete, greenish yellow, 1.5 to 3 mm in diameter; internodes up to 2.5 cm long. Leaves linear-lanceolate, the apex narrowed, acute, unequally bilobed with the subulate lobules 1 to 2 mm long, the base prominently auricled with the lobules extending across the stems, the lamina 8 to 12.5 cm long, 4 to 8 mm wide, somewhat rigid; the sheaths tubular, purplish. Flowers odorless, showy, appearing singly on the naked termination of the stems, 6 to 6.5 cm across. Flowering stems usually defoliated (if leaves are present when the plant is in flower, only the apical ones remain). Pedicellate ovary slender, 1.8 to 2 cm long. Sepals and petals pure white, lined at the base with purple. Lateral sepals oblong-lanceolate, obtuse, including the spur 4 to 4.1 cm long, obtuse, greenish and lined with purple. Dorsal sepal oblong, obtuse, 2.5 to 2.6 cm long, 1 to 1.1 cm wide at the widest portion, 7-nerved. Petals obliquely oblong-elliptic, obtuse, 2.5 to 2.7 cm long, 1.1 to 1.2 cm wide, 5-nerved. Labellum conspicuously unguiculate, simple; claw linear, the lower third tubular saccate, 1.9 to 2 cm long, conspicuously green, lamina (when expanded) broadly ovate-cordate, obtuse, margins minutely dentate or crenate-dentate, membranaceous, 2 to 2.1 cm long, 1.5 to 1.6 cm wide, with three obscure central lines throughout, pure white. Gynostemium very short and stout, clinandrium tridentate with the central tooth linear-subulate, extended into a long foot, including the foot 1.9 to 2 cm long. Anther oblong-ovoid, obtuse, about 3 mm long, 2 mm wide.

In the herbarium of Oakes Ames is a plant from Mindanao representing this species. It differs from the typical specific form in its conspicuously smaller flowers of which the petal is 1.5 cm long and about 6.5 mm wide and the entire lip, including the claw, about 2.5 cm long. Its data are Mindanao, District

of Davao, Divide on Apo Ridge, altitude 3,050 feet. Epiphyte. Flowers white. *C. M. Weber* 246, August 25, 1911.

LUZON, Manila, Bureau of Science orchid house, *Bur. Sci.* 84542 *Quisumbing*, March 11, 1931. The living plants were collected from the mountains near the source of Angat Irrigation System, Bulacan Province, growing on rocks. The plants flowered for the second time earlier (January, 1932).

A very interesting orchid and worthy of a place in orchid gardens. The species doubtless is closely allied to *Dendrobium papilio* Loher, but differs in its unbranched stems, leaves with conspicuously auricled bases, and the pure white flowers, purple-lined at the bases of petals and sepals, with green throat and claw. The margins of the labellum are minutely dentate. The plants thrive well in earthen pots with tuff and humus.

DENDROBIUM GUERREROI sp. nov. Plates 1, 7, 19, and 20.

Aff. *D. O'Brieno* et *D. amethystoglossa*. Caules aggregati, elongati, suberecti, basi attenuati, 30 ad 76 cm longi, usque ad 8 mm in diametro. Folia lanceolata vel oblongo-lanceolata, 7.5 ad 10.5 cm longa, 1.6 ad 2.5 cm lata, apice attenuata, acuta, membranacea. Racemi penduli, pauci et laxiflori, usque ad 8 cm longi, 10- ad 13-flori, e caulibus defoliatis orientes. Flores 3 ad 3.3 cm longi, 2 ad 2.2 cm lati. Sepala lateralia oblique oblong-lanceolata, acuta, 13.5 ad 14 mm longa, 7.5 ad 8.5 mm lata, 7-nervia, mentum formantia; mentum elongatum, saccatum, superne rectum vel leviter curvatum, obtusum, circiter 1.5 cm longum. Sepalum dorsale oblongo-lanceolatum, subacutum, 13 ad 15.5 mm longum, 5 ad 6 mm latum, 7-nervium. Petala oblongo-elliptica, obtusa, 14 ad 15 mm longa, 6 ad 7 mm lata, 5-nervia. Labellum simplex, elongatum, 25 ad 27 mm longum, basi unguiculata lineari, in positu naturali complanatum, cum pede gynostemii connatum; lamina ovata, 15 ad 17 mm longa, expansa 12 ad 13 mm lata, margine levissime crenulata vel integerrima, antice late rotundata vel leviter retusa, plus minusve apiculata; discus fascia una elevatula carnosae praeditus. Gynostemium brevissimum, crassum, tridentatum; stelidia lateralia recurvata, lata, obtusa, dens medius tenuis, linearis. Anthera ovoidea, circiter 2 mm longa.

Stems terete, aggregated, elongate, suberect, 30 to 76 cm long, up to 8 mm in diameter at the widest portion, narrowed at the base. Leaves distichous, deciduous, lanceolate or oblong-lanceolate, 7.5 to 10.5 cm long, 1.6 to 2.5 cm wide, nervose, membranaceous, greenish, when young flushed with purple, narrowed

to the acute apex, articulated to tubular sheaths. Leaf-sheaths purplish when young, otherwise green, membranaceous, deciduous on the lower part of the plant. Racemes pendulous, few- and laxly flowered, up to 8 cm long. Flowers 10 to 13, 2 to 2.2 cm across, 3 to 3.3 cm long, with rather straight or slightly inflexed spur. Bracts pellucid, minute, triangular, acute, up to 3.5 mm long, white flushed with purple. Pedicellate ovary 1.5 to 2.5 cm long, rose purple, pedicel slender. Lateral sepals obliquely oblong-lanceolate, acute, somewhat cucullate at the tip, 13.5 to 14 mm long near the posterior margin, 7.5 to 8.5 mm wide, 7-nerved, forming with the column-foot a mentum or spur which is elongate, straight or slightly curved, obtuse, about 1.5 cm long. Dorsal sepal slightly cucullate with the tip bent forward, oblong-lanceolate, subacute, 13 to 15.5 mm long, 5 to 6 mm wide, 7-nerved. Petals spreading, oblong-elliptic, obtuse, 14 to 15 mm long, 6 to 7 mm wide, 5-nerved, margin entire. Labellum simple, elongate, 25 to 27 mm long, claw linear, flattened, attached to the foot of the column, lamina ovate, 15 to 17 mm long, 12 to 13 mm wide at the widest portion (when expanded), the apex broadly rounded or slightly retuse, with a very minute mucro in the notch, the margin entire or finely crenulate; disc provided with a single broad central fleshy keel which is glabrous and extends from the column-foot nearly to the apex of the lip. Column white, very short and stout, 2 to 2.5 mm long, extended into an elongated foot. Anther ovoid, about 2 mm long.

LUZON, Manila, Bureau of Science orchid house, *Bur. Sci.* 84541 *Quisumbing*, July 27, 1932. The living plants were originally gathered by the botanical collectors Maximo Ramos and Pascual Convocar, of the Bureau of Science, in May, 1931, from Dinagat Island, near Mindanao. The plants are now being cultivated in the Bureau of Science orchid house, and this description was based on specimens which flowered in Manila on July 25, 1931. The flowers are showy and odorless, and last for two or three days. Pedicellate ovary rose purple; sepals naphthalene yellow, usually flushed with rose purple on the back (older flowers become cream-colored); petals paler, marguerite yellow; spur primrose yellow with shades of honey yellow at the tip and flushed on the back with rose purple; column-foot primrose yellow and minutely dotted with rose purple; gynostemium and anther white; labellum chamois and minutely dotted within (particularly at the throat) with rose purple except the tip which

is marguerite yellow, and the raised disc rosolane pink which extends from the column-foot to the very lip.

A species doubtless belonging in the group with *Dendrobium O'Brienum* Kränzl. and *Dendrobium amethystoglossum* Reichb. f. It is especially close to the first but differs in its much shorter and few-flowered racemes, in the spur, and especially the labelum.

This species is dedicated to Dr. Leon Ma. Guerrero, chief of the division of botany of the Bureau of Science and specialist in Philippine medicinal plants. The junior author greatly appreciates the encouragement Doctor Guerrero has given him during the prosecution of these studies.

Genus CYMBIDIUM Swartz

CYMBIDIUM PUBESCENS Lindl. Plates 2, 8, 21, and 22.

Cymbidium pubescens LINDL. Bot. Reg. 26 (1840) Misc. p. 75, 27 (1841) t. 38; J. J. SM. Fl. Buitenzorg. 6 (Orch. Java) (1905) 483, Fig.-Atlas (1911) fig. 368; SCHLECHTER, Die Orchideen (1927) 362.

Cymbidium aloifolium BLUME Bijdr. (1825) 378.

Cymbidium bicolor LINDL. (p. p.) Gen. & Sp. Orch. (1833) 164; MIQ. Fl. Ind. Bat. 3 (1859) 707; REICHB. F. Walp. Ann. 6 (1863) 625.

"*C. pubescens*; foliis ensiformibus striatis apice oblique bidentatis, racemo brevi pendulo, bracteis minimis squamaeformibus, sepalis petalisque linearibus acutiusculis, labelli trilobi basi saccati intus pubescentis laciniiis lateralibus acutis intermedia oblonga subundulata obtusa, lamellis rectiusculis medio interruptis." Bot. Reg. 26 (1840), misc. p. 75, no. 177. Lindl. 27 (1841) t. 38.

An epiphyte, much the habit of *Cymbidium atropurpureum* (Lindl.) Rolfe. Leaves clustered, coriaceous, sessile, dark green, ligulate-linear, 50 to 53 cm long, 1.75 to 1.9 cm wide, striated, apex very obliquely notched. Racemes pendulous, 5- to 10-flowered, 15 to 25 cm long, arising from the sides of the base; the peduncles glabrous, about 11.5 cm long, 4 mm in diameter, clothed at the base with 3 tubular sheaths; the sheaths light green, the basal ones shortest, oblong (when expanded), acute, about 3 cm long, 2 cm wide, the two upper ones linear-lanceolate, acute, 4 to 4.5 cm long, about 1.5 cm wide. Floral bracts minute, squamiform, triangular, acute, 2.5 to 3 mm long. Pedicellate ovary 1.3 to 1.5 cm long. Flowers odorless, about 3 cm across. Lateral sepals spreading, narrowly oblong or slightly oblanceolate, acute, slightly oblique, 1.5 to 1.7 cm long, 5 to 5.5 mm wide, 7-nerved. Dorsal sepal similar, erect. Petals

spreading, lanceolate or elliptic-lanceolate, acute, 1.4 to 1.55 cm long, 4.75 to 5 mm wide, 5-nerved. Labellum trilobed, suborbicular-ovate in outline when expanded, saccate at the base, minutely ciliate on both surfaces, more so within and on the margins; lateral lobes semiovate with free apices, short, triangular, porrect, acute, 3 to 3.5 mm long; middle lobe broadly oblong to suborbicular, 7 to 7.5 mm long, 5.5 to 6.25 mm wide, the apex rounded, recurved, apiculate at the very tip; the disc with a pair of subparallel fleshy lamellæ or ridges at the base in front of which stands another pair of smaller calli. Column long, arcuate, without a foot, slightly thickened at the apex, 10 to 11.5 mm long. Anther semiglobose. Pollinia 2, complanate-pyriform.

LUZON, Manila, Bureau of Science orchid house, *Bur. Sci.* 84547. *Quisumbing*, January 13, 1931. The living plants, which are now in cultivation in the Bureau of Science orchid house, were collected near Butuan, Agusan Province, Mindanao, growing on trees at low altitudes. The sepals and petals etruscan red or acajou red broadly edged with deep colonial buff; lateral lobes of the labellum ivory yellow dotted with ox-blood red; middle lobe of the labellum naples yellow and tipped with ox-blood red. Column pompeian red; anther light orange yellow above and amber brown below.

Lindley, *Bot. Reg.* 27 (1841) *t.* 38, states—"Although the woods of Singapore have been so often examined by Botanists it seems as if the forms of vegetation there were inexhaustible. The species now figured was met with by Mr. Cuming who sent it to Messrs. Loddiges." This species, which is distributed over Malay Peninsula, Sumatra, and Java, and Banca and Siam, fide Ridley, doubtless belongs in the group with *C. finlaysonianum* Lindl. and *C. atropurpureum* (Lindl.) Rolfe. It has the general habit of *C. atropurpureum* and resembles it in the form and size of leaves, but is distinct from both species in having very much shorter racemes, smaller flowers, and pubescent labellum as well as in the color of the flowers. *Cymbidium pubescens* Lindl. is here for the first time reported from the Philippines, although several sterile and fruiting specimens in the herbarium of Oakes Ames perhaps represent it. The plant thrives best in orchid pots with crushed tuff as a substratum or in wooden baskets. The cymbidiums of the Philippines are some of the most hardy of orchids and they even grow luxuriantly perched on branches of trees.

Genus SARCOCHILUS R. Brown

SARCOCHILUS BENGUETENSIS sp. nov. Plates 1, 9, and 23.

Herba epiphytica, carnosa. Caules leviter elongati, 8 ad 13 cm longi, teretes, radices crassas proferentes. Folia disticha, valde carnosa, rigida, oblonga vel elliptico-oblonga, obtusa, 6 ad 8 cm longa, 1.8 ad 2.3 cm lata, ad apicem inaequaliter biloba, in sicco rugosa, coriacea, 6 ad 12 mm distantia, vaginis persistentibus. Inflorescentiae breves, foliis multo breviores, usque ad 3 cm longae, pedunculus glaber, usque ad 1.2 cm longus; rhachis inflorescentiae leviter incrassata, 2 ad 3 mm in diametro; bracteae squamiformes, circiter 4 mm longae, obtusae. Flores odoratissimi, in racemo cylindraceo laxo pauciflora dispositi, 10.5 ad 11 mm lati; pedicellus cum ovario gracilis, 6 ad 7 mm longus; bracteae florales minutae, triangulares, acutae, usque ad 2 mm longae. Sepala lateralia oblique late ovata, obtusa ad apicem, dorso leviter carinata, circiter 4 mm longa, 3.5 ad 3.75 mm lata, 3-nervia. Sepalum dorsale cucullatum, oblongo-ovatum, obtusum, leviter retusum, circiter 4 mm longum, 2.75 latum, 3-nervium. Petala oblongo-lanceolata vel elliptico-lanceolata, valde obtusa, uninervia, circiter 3.75 mm longa, 1.25 mm lata. Labelum pedi columnae affixum, calcaratum, 3-lobatum; lobi laterales erecti, petaloidei, lineares, obtusi, circiter 2.75 mm longi, 0.75 mm lati; lobus intermedius carnosissimus, abbreviatus, papillo-sus. Calcar supra lobum medium cylindraceo-conicum, complanatum, late obtusum, circiter 4 mm longum, 2 mm latum. Gynostemium brevissimum, circiter 1.5 mm longum, in pedem circiter 2.5 mm longum extensum.

An epiphytic herb; the stems somewhat elongated, 8 to 13 cm long, terete. Leaves distichous, very fleshy, rigid, oblong or elliptic-oblong, obtuse, 6 to 8 cm long, 1.8 to 2.3 cm wide, unequally and minutely bilobed at the apex, when dry rugose and coriaceous, 6 to 12 mm distant, articulated to persistent sheaths. Inflorescences much shorter than the leaves, few-flowered, up to 3 cm long; the peduncles glabrous, up to 1.2 cm long; the rachis 2 to 3 mm in diameter, provided with squamiform obtuse bracts about 4 mm long. Flowers very fragrant, 10.5 to 11 mm across; pedicellate ovary slender, 6 to 7 mm long; floral bracts minute, triangular, acute, up to 2 mm long. Lateral sepals broadly ovate, very oblique, obtuse, keeled on the back at the apex, about 4 mm long, 3.5 to 3.75 mm wide, 3-nerved. Dorsal sepal cucullate, oblong-ovate, obtuse, somewhat retuse, about 4 mm long, 2.75 mm wide, 3-nerved. Petals oblong-lanceolate or elliptic-

lanceolate, broadly obtuse, 1-nerved, about 3.75 mm long, 1.25 mm wide. Labellum attached to the foot of the column, spurred, 3-lobed; lateral lobes erect, petaloid, linear, slightly curved, obtuse, about 2.75 mm long, 0.75 mm wide; middle lobe a short fleshy, conical, papillose tooth; spur cylindric-conic, dorsoventrally flattened, about 4 mm long, 2 mm wide, the tip broadly rounded or subtruncate. A pair of minute uncinata lobules stand inside the base of the lateral lobes. Gynostemium very short, about 1.5 mm long, extended into a foot about 2.5 mm long. Pollinia 4, complanate-ovoid, unequal.

LUZON, Benguet Subprovince, Baguio, gardens of the Mansion House, *Bur. Sci.* 82203 *Quisumbing*, May 6, 1931. The living plants were originally from the mountains near Baguio, but the exact locality is unknown. At present the living plants are growing in the Bureau of Science orchid house. Sepals and petals white dotted with purple-red; labellum white except the inner surfaces of the lateral lobes which are dotted with purple-red; anther yellow; back side of the column carmine; pedicellate ovary marguerite yellow.

Among the Philippine species, this plant appears to be allied to *Sarcochilus palawanensis* Ames but differs strikingly in its short racemes and in the dissimilar form of the perianth segments.

Genus PHALAEOPSIS Blume

PHALAEOPSIS LUEDDEMANNIANA Reichb. f. var. PURPUREA var. nov. Plates 2, 10, and 24.

Haec varietas floribus omnino purpureis haud striatis a *P. Lueddemanniana* differt.

Plant suberect. Leaves oblong-elliptic to narrowly obovate, thick, fleshy, slightly rigid, subacute, 8.5 to 14 cm long, 4.5 to 6 cm wide, shining on both surfaces. Scapes not branching, few-flowered; rachis 10.5 to 13.5 cm long. Flowers odorless, about 3.5 cm across, true purple and absolutely without transverse bars on the sepals and petals in front, and obscurely reticulated with white on the back. The tips of sepals are white. Pedicellate ovary white, 3 to 3.5 cm long. Lateral sepals obliquely ovate, acute, apiculate, 1.9 to 2.2 cm long, 1 to 1.3 cm wide (when spread out), 9-nerved. Dorsal sepal erect, elliptic-lanceolate, acute and apiculate, 1.9 to 2.2 cm long, about 0.9 cm wide, 9-nerved. Petals oblong-elliptic, subobtuse, 1.8 to 2 cm long, 0.8 to 0.9 cm wide, 7-nerved. Labellum fleshy, 3-lobed; lateral lobes erect, quadrate-oblong, bidentate at the broad apex, with a

prominent fleshy callus above the middle, about 7 mm long, light orange except the terminal horns which are mallow pink and the base which is white; middle lobe lanceolate or oblong-lanceolate, obtuse, 1.4 to 1.5 cm long, 0.6 to 0.7 cm wide at the widest portion. Disc provided with several distinct calli: near the base, between the side lobes, an obscurely 3-lobed plurituberculate callus; at the base of the middle lobe a pair of slender sharp teeth and a longer thin high median keel which extends to the middle of the terminal lobe where it is continued by irregular teeth and terminates in a fleshy callus (toothed or fringed at the base) which extends to the apex of the lip. Column 1 to 1.3 cm long, white with a mallow pink base.

LUZON, Manila, Bureau of Science orchid house, *Bur. Sci.* 84550 *Quisumbing*, June 6, 1931. The living plants were presented to the junior author by Mr. Constinoble, of Del Carmen, Pampanga Province, Luzon, who collected them at Balete Pass, Nueva Ecija Province, Luzon, growing on tree trunks.

The variety is characterized by the complete absence of transverse bars on the sepals and petals. It further differs from the species in its smaller floral segments and leaves.

Genus GASTROCHILUS D. Don

GASTROCHILUS CALCEOLARIS D. Don. Plates 2, 11, and 25.

Gastrochilus calceolaris D. DON, Prodr. Fl. Nep. (1825) 32.

Saccolabium calceolare LINDL. in Wall. Cat. No. 7302, Gen. & Spec. Orch. (1833) 223; Sert. Orch. Frontisp. (1838) No. 6, in Bot. Reg. (1838) Misc. p. 75, No. 139, in Journ. Linn. Soc. 3 (1859) 33; GRIFF., Notul. 3 (1851) 356, Itin. Notes (1848) 170, No. 869, Ic. Pl. Asiat. 3 (1851) t. 334; REICHB. f. in Walp. Ann. 6 (1864) 883; Hook. f., Fl. Brit. Ind. 6 (1890) 60; KING and PANTL. in Ann. Roy. Bot. Gard. Calcutta 8 (1898) 225, t. 300; J. J. SM., Fl. Buitenzorg (Orch. Jav.) (1905) 632, Fig.-Atlas (1908) t. 472 (as *Gastrochilus*).

Aerides calceolare SM. in Rees. Cycl. (1819) Addend. & Corrigend.

Aerides leopardinum WALL. apud Lindl., Sert. Orch. (1838) No. 6, in *synon.*

Gastrochilus sororius SCHLTR. in Fedde. Repert. 12 (1913) 315.

Sarcochilus nepalensis SPRENG. Syst. Veg. 3 (1826) 721.

Epidendrum calceolare BUCH.-HAM. apud D. Don, Prodr. Fl. Nep. (1825) 32, in *synon.*

Gastrochilus philippinensis AMES, Orch. 5 (1915) 231, in MERR. Enum. Philip. Fl. Pl. 1 (1925) 434.

GASTROCHILUS. *Labellum* ventricosum-inflatum, sessile, indivisum, apice appendice rotundatâ papilloso-glandulosâ erosâ crenatâ auctum. *Prianthii foliola* omnia distincta, subaequalia, patula. *Columna* brevissi-

ma. *Massae pollinis* 2, integrae, sessiles, apici stigmatis adnatae. Herba arboribus parasitica. Caudex brevis, radicans, erectus. Folia linearilanceolata, 5-7 pollices longa, 3-5 lineas lata, coriacea, enervia, plana, glabra. Scapi brevissimi, ex inferiore caudicis ortum ducentes, vix ibidem aequantes, pluri (3-5)-flori. Pedunculi patuli, uniflori. Flores facie fere Cypripedii at minimi. Perianthii foliola 5, distincta, obovata, subaequalia. Labellum valde ventricosum, foliolis brevius, margine rectum, anticè appendiculatum.

Obs. Nomen ἀγχιον, venter, et χαλαρόν, labium; id est labium ventricosum.

1. *G. calceolaris*.

Epidendrum calceolare. Hamilton MSS.

Hab. ad Narainhetty Nepalensium, Hamilton, Wallich. Floret Februario." Ex. D. Don, Prodr. Fl. Nep. (1825) 32.

"16. *Saccolabium calceolare*. Lindl. in Wall. Cat. No. 7302.

S. subacaule, foliis loratis acuminatis apice oblique bidentatis, corymbis multifloris breviter pedunculatis, sepalis petalisque obovato-oblongis obtusis, labelli calcare inflato orbiculato; laminâ lunatâ rotundatâ ciliatâ.

Gastrochilus calceolaris Don Prodr. Nep. 32. *Aeridis calceolare*, Smith in Rees. suppl. Hab. in Nepalia et Sylhet, Wallich. (hab. s. sp. e Mus. Angl. Ind. et v. ic. pict.). Folia 9 p. longa, basi maculata. Sepala et petala flava, maculis, subrotundis purpureis notata. Labellum album; laminâ basi luteo et coccineo punctatâ." Ex. Lindl., Gen. & Sp. Orch. (1833) 223.

Stems pendulous, about 8 cm long, up to 6 mm in diameter. Roots terete, up to 18 cm long, 3 to 3.5 mm in diameter. Leaves distichous, the lower ones imbricated, light green, oblong, oblong-elliptic, or oblanceolate, narrowed to the very unequally bilobed apex, 14 to 16 cm long, 2.5 to 2.8 cm wide, submembranaceous when dry. Racemes short, corymbose, 3 to 3.5 cm long, 8- to 10-flowered, peduncles green spotted with dark brown, stout and fleshy, 1.3 to 1.5 cm long, provided at the base with two short tubular sheaths which are 3 to 4 mm long. Floral bracts cucullate, ovate, obtuse, rigid, up to 3.5 mm long. Pedicellate ovary reed yellow, 7 to 8 mm long, lined with green. Flowers odorless, crowded, about 1.5 cm across. Sepals and petals fleshy, reed yellow to olive yellow spotted with chocolate on the sepals and brick red on petals. Sepals oblong-obovate, obtuse, about 7 mm long, 4 mm wide at the widest portion. Petals narrower, obovate-spatulate. Labellum 5 to 5.5 mm long, adnate to the lower half of the column, basal portion forming a conical, obtuse sac, 5 to 5.5 mm deep, white blotched with mallow pink, the very tip cream color; lateral lobes inconspicuous, erect; middle lobe subreniform, 3 to 4 mm long, 6 to 7 mm wide, margins deeply and unequally fimbriated, upper surface, except for a V-shaped zinc orange basal callus covered with white hairlike papillæ. At

the center of the callus there is a Naples yellow ridge. Column very short, stout, white flushed with pink. Anther somewhat flattened, shortly beaked, chartreuse yellow. Pollinia ellipsoid.

LUZON, Manila, Miyasaki Gardens, *Bur. Sci.* 82231 *Quisumbing*, February 7, 1931. The living plants were collected from Baguio, Benguet Subprovince by Mr. S. Miyasaki, an orchid grower, and are now in cultivation in his gardens. The first Philippine specimen was collected by A. D. E. Elmer 6517 (type of *G. philippinensis* Ames) in Baguio, June 28, 1904. The species has also been reported from Sikkim and the Khasia Hills, Java, Sumatra, and Assam.

After a careful study of this Philippine material, it has been found necessary to reduce *G. philippinensis* Ames to synonymy as the characters relied on for specific distinction have proved to be unreliable.

Genus VANDOPSIS Pfitzer

VANDOPSIS DAVISII sp. nov. Plates 2, 12, 26, and 27.

Herba valida, 20 ad 60 cm alta. Radices elongatae, brunneae, glabrae. Caules teretes, vaginiis foliorum omnino tecta, 1.2 ad 1.5 cm in diametro. Folia disticha, ligulata, valde rigida, falcato-decurvata, 1.5 ad 3.5 cm distantia, ad apicem inaequaliter bilobata cum lobis obtusis, medio canaliculata, 16 ad 39 cm longa, 2.3 ad 3.5 cm lata (in sicco valde coriacea haud nervosa), valde rugosa. Pedunculus 13 ad 14.5 cm longus, 4 ad 5 mm in diametro, rigidus, glaber, erectus. Inflorescentiae racemosae, 10- ad 14-florae, erectae. Pedicellus cum ovario albidus, 2 ad 2.5 cm longus, rigidus, glaber. Bractee inflorescentiae squamiformes, breves, ovatae, cucullatae, circiter 3 mm longae; bractee caulinae tubulares, 3 ad 4 mm longae. Flores albido-virides, 2.2 ad 2.4 cm lati, 3.2 ad 3.3 cm longi, carnosii. Sepala breviter unguiculata. Sepala lateralia ovato-elliptica, obtusa, circiter 1.5 cm longa, 7 mm lata. Sepalum dorsale ovato-oblongum, obtusum, circiter 1.6 cm longum, supra medium 7 mm latum. Petala oblonga, obtusa, circiter 1.4 cm longa, 5.5 ad 6 mm lata. Labellum trilobatum, base valde saccata, circiter 1.1 cm longum; lobi laterales parvi, erecti, triangulares, circiter 2 mm alti, late rotundati, carnosii, utrinque glabri; lobus medius multo major, carnosus, lateraliter compressus, rigidus, in circuitu (supra visus) ovato-lanceolatus, circiter 7 mm longus, subtus prominenter carinatus, supra minutissime pubescens, apice truncatus. Carina transversa suborbicularis valde concava in basi saccata stat. Gynostemium breve, crassum, circiter 6 mm longum gla-

brum, ad apicem biconnutum. Anthera glabra. Pollinia 4, subaequalia. Capsula ellipsoidea, valde saccata, 6 ad 6.5 cm longa, 1.7 ad 1.8 cm in diametro.

A very coarse herb, 20 to 60 cm high, recalling *Sarcanthus pachyphyllus* Ames. Roots elongate, brown, glabrous. Stems terete, coarse, very rigid, usually erect, sometimes curved, altogether concealed by the tubular leaf-sheaths, 1.2 to 1.5 cm in diameter. Leaves distichous, ligulate, 16 to 39 cm long, 2.3 to 3.5 cm wide, very rigid, very thickly leathery, falcate-decurved, in texture approaching those of *Sarcanthus pachyphyllus*, 1.5 to 3.5 cm distant, unequally bilobed at the apex with obtuse lobes, channelled through the middle (when dry very coriaceous and never nerved), very rugose. Peduncles erect, rigid, 13 to 14.5 cm long, 4 to 5 mm in diameter, glabrous. Inflorescences in the upper part of the peduncle, racemose, 10- to 14-flowered, erect. Pedicellate ovary white, 2 to 2.5 cm long, rigid, glabrous, twisted at the base. Bracts of the inflorescence squamiform, short, ovate, cucullate, about 3 mm long. Flowers fragrant, fleshy, firm, 2.2 to 2.4 cm across, 3.2 to 3.3 cm long. Sepals shortly clawed. Lateral sepals ovate-elliptic, obtuse, about 1.5 cm long, 7 mm wide. Dorsal sepal ovate-oblancheolate, obtuse, about 1.6 cm long, 7 mm wide about the middle. Petals oblancheolate, obtuse, about 1.4 cm long, 5.5 to 6 mm wide. Labellum trilobed, conspicuously saccate at the base, about 1.1 cm long; lateral lobes small, erect, triangular, about 2 mm high, broadly rounded, fleshy, glabrous on both surfaces; middle lobe much larger, fleshy, laterally compressed, in outline (when seen from above) ovate-lanceolate, rigid, about 7 mm long, prominently carinate beneath, very minutely pubescent above, truncate at the apex. At the saccate base of the labellum (between the lateral lobes) there is a small transverse, suborbicular, deeply concave keel as in *Staurochilus ionosma*. Gynostemium short, stout, about 6 mm long, glabrous, 2-horned at the apex with falcate horns. Anther glabrous. Pollinia 4, subequal. Capsules ellipsoid, 6 to 6.5 cm long, 1.7 to 1.8 cm in diameter, prominently 3-keeled (between each keel there are two shallow ridges).

LUZON, Manila Bureau of Science orchid house, *Bur. Sci.* 82228 *Quisumbing*, March 31, 1931. The living plants, according to orchid peddlers, were originally collected from the mountains near Montalban, Rizal Province, Luzon. They are now in cultivation in the Bureau of Science orchid house, Miyasaki Gardens, and Mrs. Remedios C. Gonzales's gardens, all in Ma-

nila. Rachis of the inflorescence greenish; pedicellate ovary white; sepals and petals white on back and front washed with lumiere green or light lumiere green, and spotted and barred with claret brown on the petals and raw umber on the sepals; lateral lobes of the labellum pale viridine yellow; middle lobe of the labellum white; spotted with ox-blood red above, on both sides of the keel above and empire yellow at the very tip of the tongue; callus at the base of the labellum between the lateral lobes cuplike, white, light orange yellow within.

In habit this unique species suggests *Sarcanthus pachyphyllus*, especially in the very rigid, thick, keeled, falcate leaves, but it differs radically in floral characters. In floral structure it is very much like *Vandopsis lissochiloides* (Gaudich.) Pfitz., but its flowers are much smaller and of different color.

This very interesting species is dedicated to Hon. Dwight F. Davis, for his interest in orchids and particularly for his unselfish devotion and interest in his work when Governor-General of the Philippines.

Genus MICROSACCUS Blume

MICROSACCUS WENZELII Ames. Plates 1, 13, and 28.

Microsaccus Wenzelii AMES Orch. 5 (1915) 257, in Merr. Enum. Philip. Fl. Pl. 1 (1925) 442.

Planta pusilla, epiphytica. Radices in basi caulium. Caules dependentes (?) usque ad 1 dm. alti, circiter 3 mm. in crassitudine, cum foliis usque ad 4 cm. lati, vaginis foliorum persistentibus obtegentibus: internodia breviter vaginis omnino tecta, 3 mm. longa. Folia biseriata, patentissima, equitantia, crasse carnosae, lateraliter compressa, oblonga a latere visa, dorso et apice acutangula, obtusa sed a basi sensim angustata, in sicco valde rugosa, usque ad 2 cm. longa, circiter 5 mm. alta, supra canaliculata. Inflorescentiae axillares, brevissimae, 1 (-2) florae. Pedunculus folii vaginis aequilongus. Bractee ovatae vel orbiculares, valde concavae, extus leviter carinatae, membranaceae, usque ad 5 mm. longae. Flores parvi, albi. Sepala lateraliter leviter falcata, obtusa, extus, prope apicem, carinata, trinervia, vix 5 mm. longa, 2 mm. lata. Sepalum dorsale sepalis lateralibus minus, ad apicem cucullatum et incrassatum vel carinatum, 4 mm. longum, 1.5 mm. latum, trinervium. Petala oblongi-lanceolata, uninervia, obtusa, 3 mm. longa, 1 mm. lata. Labellum calcaratum, spathulatum vel cuneato-obovatum, ad apicem obscure trilobatum, in disco bicaulosum. Lamina incrassata cum calcaribus 7 mm. longa, ad apicem 3 mm. lata. Calcar circiter 2 mm. longum, scrotiforme, emarginatum. Gynostemium brevissimum. Fructus 7 mm. longus.

Epiphyte. Stems curved in maturity, the base terete, leafless, but covered with remnants of sheaths, the apical portion foliose, up to 11.5 cm long. Roots fibrous, numerous. Leaves con-

spicuously and densely distichous, equitant, imbricating, sessile, lanceolate, obtuse, decreasing but little in size toward the apex, the largest up to 2 cm long, 6 mm wide, rigid, leathery, thick, flattened, rugose when dry; internodes very short. Flowers small, white, single in the axils of the leaves, about 8 mm across. Pedicellate ovary very slender, about 1.5 mm long, entirely covered by imbricated, triangular, acute bracts which are 3.5 to 4 mm long. Lateral sepals obliquely elliptic, slightly falcate, obtuse, about 5 mm long, 2.5 mm wide. Dorsal sepal narrowly oblong, obtuse, about 5 mm long, 1.75 mm wide, 3-nerved. Petals oblong-lanceolate, obtuse, about 4 mm long, 1.5 mm wide. Labellum simple, obovate, fleshy, about 4 mm long, obscurely trilobed, apex expanded, 2 mm wide, subacute, the very apex thickened beneath. Spur short, flattened, emarginate, about 2.5 mm long. Column very minute, about 1 mm long.

LUZON, Manila, Bureau of Science orchid house, *Bur. Sci.* 82230 *Quisumbing*, January 24, 1931. The living plants were originally gathered by Mr. Maximo Ramos, botanical collector of the Bureau of Science, at Quezon National Park, Tayabas Province, growing on tree trunks. LEYTE, Dagami, *C. A. Wenzel*, 0159, 029, October 25, 1912 (type).

This species is closely related to *Microsaccus brevifolius* J. J. Sm., differing in habit and in the form of the sepals and petals.

ILLUSTRATIONS

PLATE 1

- FIG. 1. *Microsaccus Wenzelii* Ames, front view of a flower, $\times 2$.
 2. *Microsaccus Wenzelii* Ames, side view of a flower, $\times 2$.
 3. *Coelogyne Remediosae* sp. nov., front view of a flower, $\times 1$.
 4. *Coelogyne Remediosae* sp. nov., side view of a flower, $\times 1$.
 5. *Agrostophyllum saccatilabium* sp. nov., front view of a flower, $\times 4$.
 6. *Agrostophyllum saccatilabium* sp. nov., side view of a flower, $\times 4$.
 7. *Dendrobium Guerreroi* sp. nov., front view of a flower, $\times 1$.
 8. *Dendrobium Guerreroi* sp. nov., side view of a flower, $\times 1$.
 9. *Dendrobium auriculatum* sp. nov., front view of a flower, $\times 1$.
 10. *Dendrobium auriculatum* sp. nov., side view of a flower, $\times 1$.
 11. *Dendrochilum Weberi* Ames, front view of a flower, $\times 4$.
 12. *Dendrochilum Weberi* Ames, side view of a flower, $\times 4$.
 13. *Sarcochilus benguetensis* sp. nov., front view of a flower, $\times 2$.
 14. *Sarcochilus bnequetensis* sp. nov., side view of a flower, $\times 2$.

PLATE 2

- FIG. 1. *Gastrochilus calceolaris* D. Don, front view of a flower, $\times 2$.
 2. *Gastrochilus calceolaris* D. Don, side view of a flower, $\times 2$.
 3. *Gastrochilus calceolaris* D. Don, view of column, anther and labellum from above, $\times 4$.
 4. *Cymbidium pubescens* Lindl., front view of a flower, $\times 1$.
 5. *Cymbidium pubescens* Lindl., side view of a flower, $\times 1$.
 6. *Phalaenopsis Lueddemanniana* Reichb. f. var. *purpurea* var. nov., front view of a flower, $\times 1$.
 7. *Phalaenopsis Lueddemanniana* Reichb. f. var. *purpurea* var. nov., side view of a flower, $\times 1$.
 8. *Vandopsis Davisii* sp. nov., front view of a flower, $\times 1$.
 9. *Vandopsis Davisii* sp. nov., side view of a flower, $\times 1$.
 10. *Vandopsis Davisii* sp. nov., front view of ovary, column and labellum, $\times 2$.
 11. *Vandopsis Davisii* sp. nov., side view of column and labellum, $\times 2$.

PLATE 3

- Coelogyne Remediosae* sp. nov.: 1, dorsal sepal, $\times 2$; 2, lateral sepal, $\times 2$; 3, petal, $\times 2$; 4, labellum and column from above, $\times 2$; 5, side view of column and labellum, $\times 2$; 6, front view of column, $\times 2$; 7, view of anther from above, $\times 17$; 8, view of anther from below, $\times 17$; 9, side view of anther, $\times 17$; 10, two pollinia, $\times 17$.

PLATE 4

Dendrochilum Weberi Ames: 1, dorsal sepal, $\times 16$; 2, lateral sepal, $\times 16$; 3, petal, $\times 16$; 4, view of column and labellum from above (natural position), $\times 28$; 5, side view of column and labellum, $\times 28$; 6, view of labellum (expanded) from above $\times 36$; 7, front view of column, $\times 28$; 8, views of anther from above and from below, $\times 36$; 9, pollinia, $\times 28$.

PLATE 5

Agrostophyllum saccatilabium sp. nov.: 1, a spike showing floral bracts and buds, $\times 4$; 2, a floral bract, $\times 15$; 3, dorsal sepal viewed from within, $\times 12$; 4, lateral sepal viewed from without, $\times 12$; 5, outer view of petal, $\times 12$; 6, side view of column, and labellum, $\times 12$; 7, view of labellum from above (in natural position), $\times 12$; 8, front view of column with the labellum removed, $\times 12$; 9, view of anther from above, $\times 34$; 10, pollinia, $\times 52$.

PLATE 6

Dendrobium auriculatum sp. nov.: 1, portion of the stem with leaves, $\times 0.5$; 2, detail of the base of the leaf and its attachment, $\times 2$; 3, dorsal sepal, $\times 1$; 4, lateral sepal, spur, and pedicellate ovary, $\times 1$; 5, petal, $\times 1$; 6, view of column and labellum from above (natural position), $\times 1$; 7, view of labellum (expanded) from above, $\times 1$; 8, side view of ovary, column, spur, and labellum (natural position), $\times 1$; 9, front view of column with foot, $\times 2$; 10, side view of pedicellate ovary, column, and spur with lateral sepals removed, $\times 2$; 11, view of anther from above, $\times 6$; 12, view of anther from below, $\times 6$; 13, pollinia, $\times 6$.

PLATE 7

Dendrobium Guerreroi sp. nov.: 1, dorsal sepal, $\times 2$; 2, lateral sepal and pedicellate ovary, $\times 2$; 3, petal, $\times 2$; 4, side view of ovary, column, and labellum, $\times 2$; 5, front view of column and labellum (natural position), $\times 2$; 6, view of (extended) labellum from above, $\times 2$; 7, side view of ovary and column with anther, $\times 4$; 8, front view of column with foot, $\times 4$; 9, view of anther from above, $\times 12$; 10, view of anther from below, $\times 12$; 11, two pollinia, $\times 12$.

PLATE 8

Cymbidium pubescens Lindl.: 1, dorsal sepal, $\times 3$; 2, petal, $\times 3$; 3, lateral sepal, $\times 3$; 4, view of column and expanded labellum from above, $\times 4$; 5, side view of portion of ovary, column, and labellum, (natural position), $\times 4$; 6, view of anther from above, $\times 15$; 7, view of anther from below, $\times 15$; 8, pollinia, $\times 30$.

PLATE 9

Sarcochilus benguetensis sp. nov.: 1, dorsal sepal, $\times 12$; 2, lateral sepal, $\times 12$; 3, petal, $\times 15$; 4, side view of column, labellum and spur, $\times 12$; 5, view of labellum with side lobes expanded from above, $\times 8$; 6, front view of column and anther, $\times 15$; 7, view of anther from below, $\times 28$; 8, pollinia, $\times 28$.

PLATE 10

Phalaenopsis Lueddemanniana Reichb. f. var. *purpurea* var. nov.: 1, dorsal sepal, $\times 2$; 2, petal, $\times 2$; 3, lateral sepal, $\times 2$; 4, view of column and labellum from above (natural position), $\times 4$; 5, view of labellum (expanded) from above, $\times 4$; 6, side view of column and labellum (natural position), $\times 4$; 7, views of anther from below and from above, $\times 5$; 8, pollinia, $\times 6$.

PLATE 11

Gastrochilus calceolaris D. Don: 1, dorsal sepal, $\times 4$; 2, petal, $\times 4$; 3, lateral sepal, $\times 4$; 4, side view of column and labellum, $\times 7$; 5, view of column and labellum from above, $\times 7$; 6, view of anther from above, $\times 15$; 7, view of anther from below, $\times 15$; 8, two pollinia, $\times 28$.

PLATE 12

Vandopsis Davisii sp. nov.: 1, dorsal sepal, $\times 3$; 2, petal, $\times 3$; 3, lateral sepal, $\times 3$; 4, side view of portion of ovary, column with anther and labellum, $\times 5$; 5, front view of column, and labellum, $\times 5$; 6, view of labellum from above with the lateral lobes slightly expanded, $\times 5$; 7, view of anther from above, $\times 15$; 8, view of anther from below, $\times 15$; 9, pollinia, $\times 15$; 10, fruit, $\times 1$.

PLATE 13

Microsaccus Wenzelii Ames: 1, habit of the plant with one flower, $\times 1$; 2, dorsal sepal, $\times 7.5$; 3, lateral sepal, $\times 7.5$; 4, petal, $\times 7.5$; 5, side view of ovary, column, and labellum, $\times 7.5$; 6, view of spur, column with anther removed, and labellum from above, $\times 7.5$; 7, view of anther from above, $\times 13$; 8, view of anther from below, $\times 13$; 9, pollinia, $\times 11$.

PLATE 14

Coelogyne Remediosae sp. nov.: habit, very much reduced, and flower, reduced.

PLATE 15

FIG. 1. *Dendrochilum Weberi* Ames: habit, very much reduced.

2. *Dendrochilum Weberi* Ames: flowers and portion of plant, very slightly enlarged.

PLATE 16

Agrostophyllum saccatilabium sp. nov.: habit, very much reduced.

PLATE 17

Agrostophyllum saccatilabium sp. nov.: inflorescence and leaf-bases, slightly enlarged.

PLATE 18

FIG. 1. *Dendrobium auriculatum* sp. nov.: habit, very much reduced.
2. *Dendrobium auriculatum* sp. nov.: flower, slightly enlarged.

PLATE 19

Dendrobium Guerreroi sp. nov.: habit, very much reduced.

PLATE 20

Dendrobium Guerreroi sp. nov.: flowers, slightly reduced.

PLATE 21

Cymbidium pubescens Lindl.; habit, very much reduced.

PLATE 22

Cymbidium pubescens Lindl.; flowers and raceme, almost natural size.

PLATE 23

Sarcochilus benguetensis sp. nov.; habit, very much reduced.

PLATE 24

FIG. 1. *Phalaenopsis Lueddemanniana* Reichb. f. var. *purpurea* var. nov.; habit, very much reduced.
2. *Phalaenopsis Lueddemanniana* Reichb. f. var. *purpurea* var. nov.; flower, slightly enlarged.

PLATE 25

Gastrochilus calceolaris D. Don; habit, much reduced.

PLATE 26

Vandopsis Davisii sp. nov.; habit, very much reduced.

PLATE 27

Vandopsis Davisii sp. nov.; flowering raceme, slightly reduced.

PLATE 28

FIG. 1. *Microsaccus Wenzelii* Ames; habit, very slightly enlarged.
2. *Microsaccus Wenzelii* Ames; tops of plants, each with a flower, enlarged about thrice natural size.

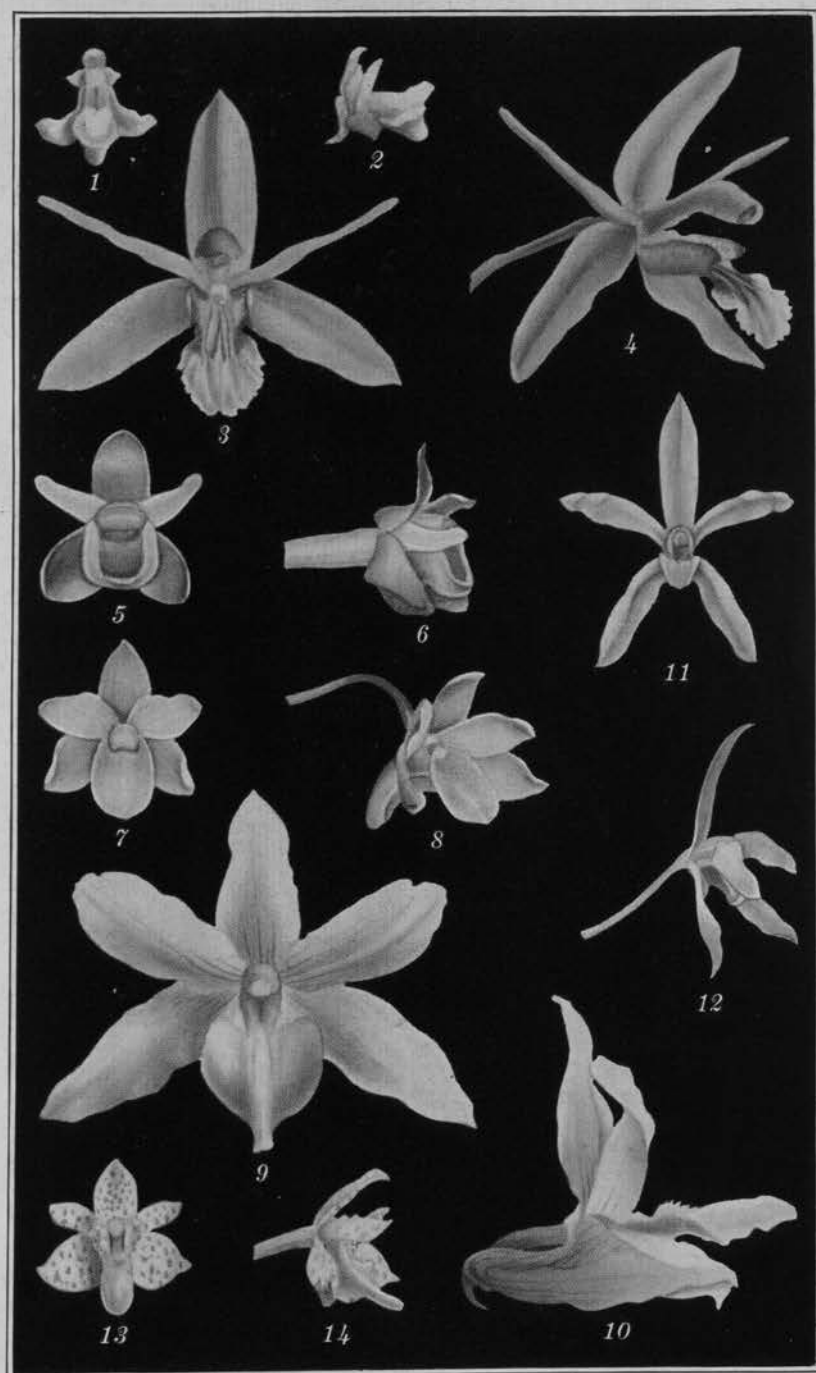


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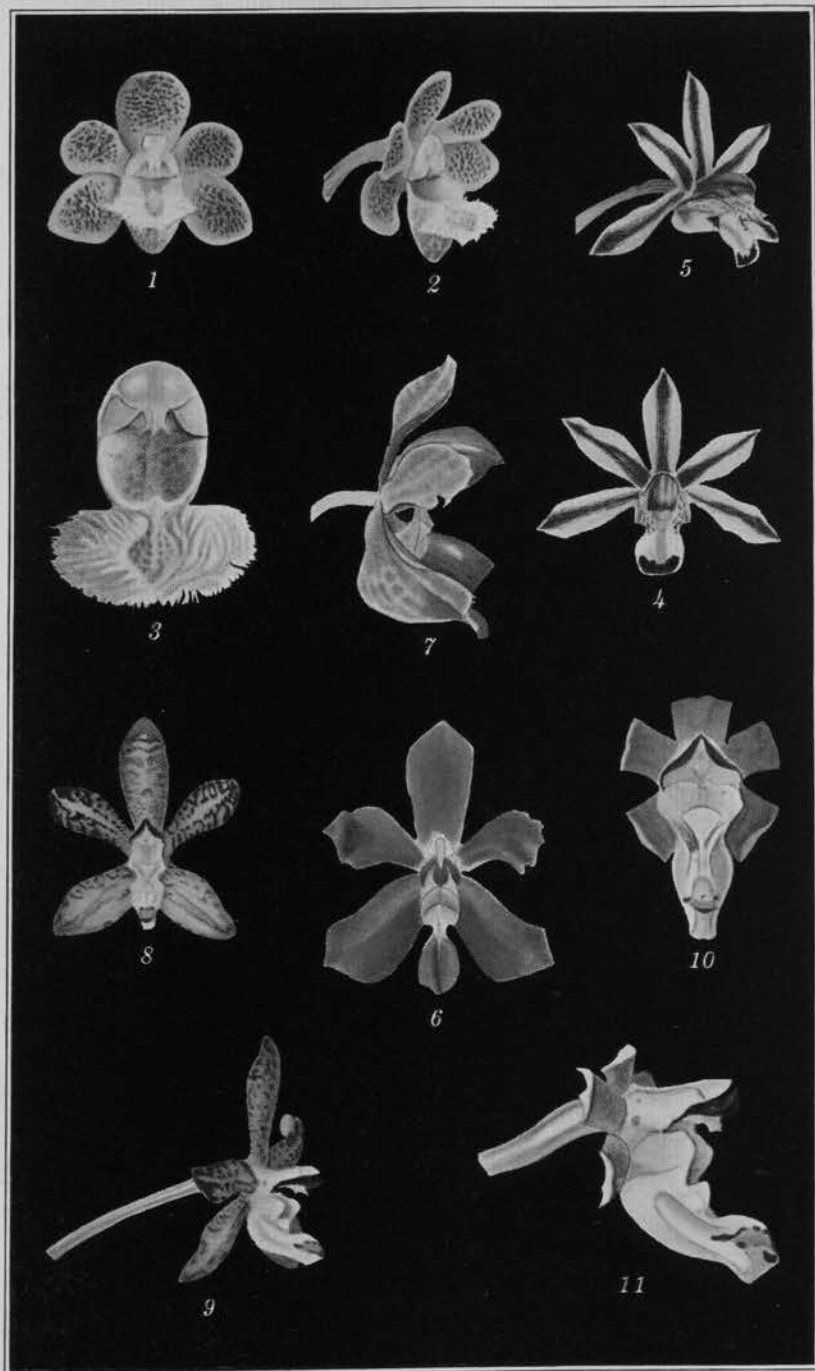


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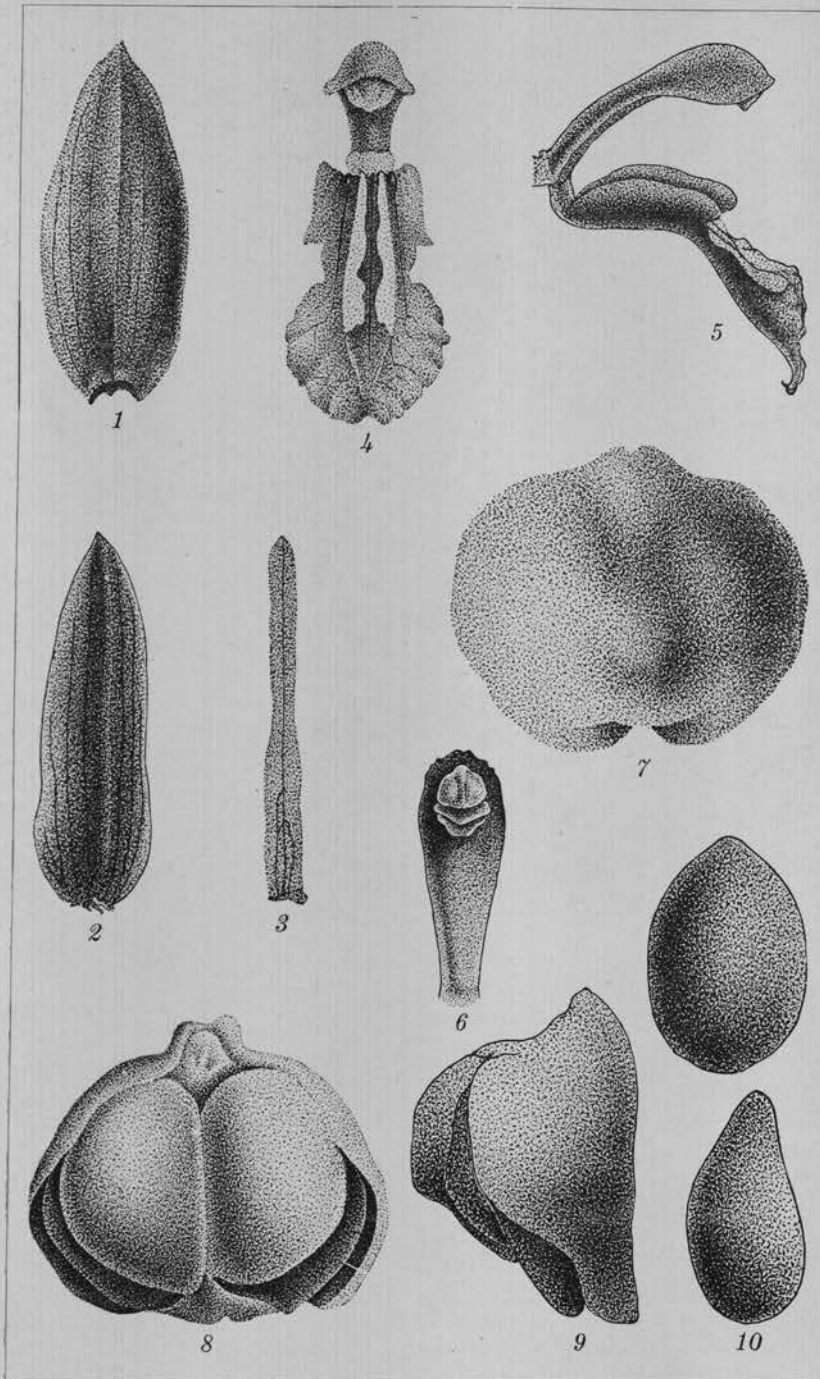


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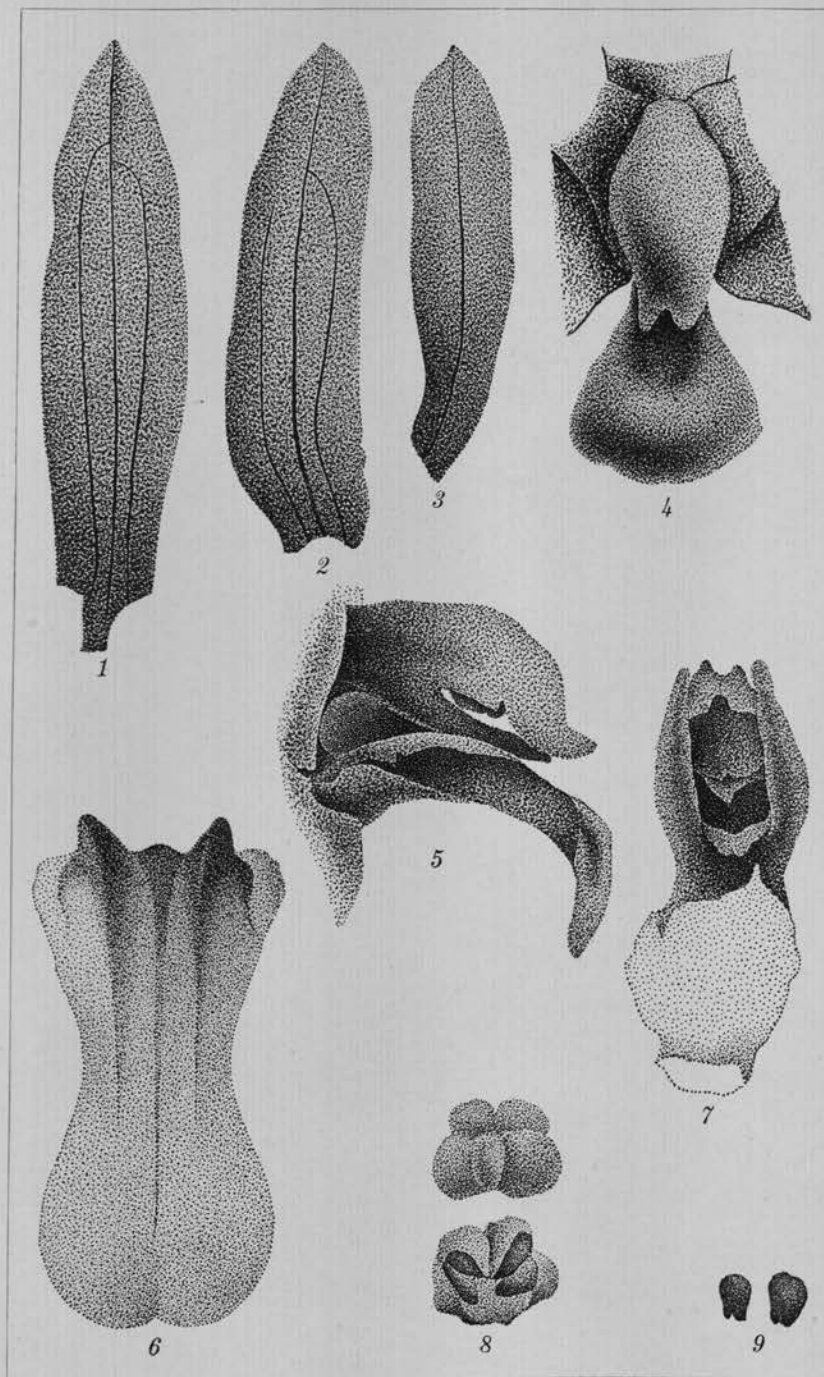


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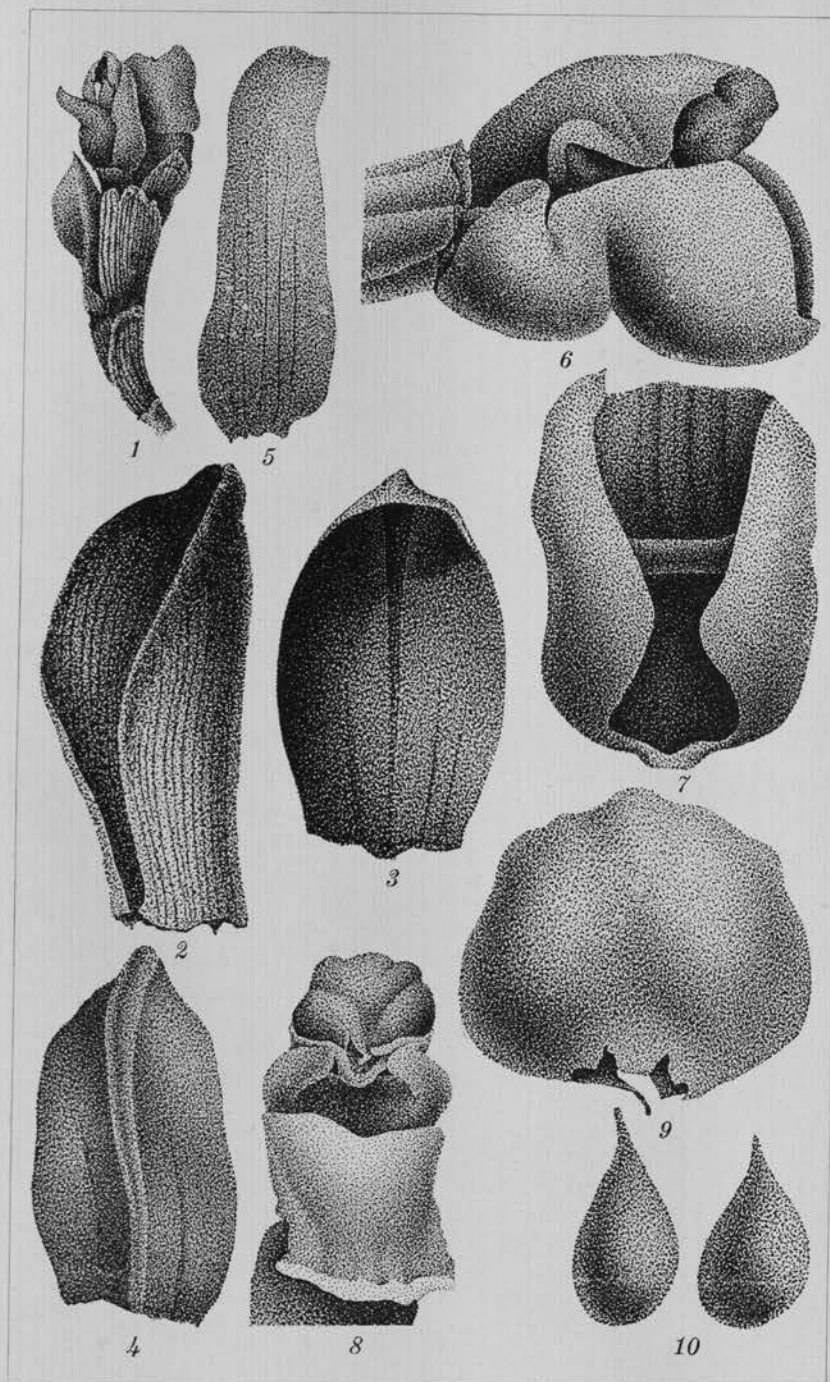


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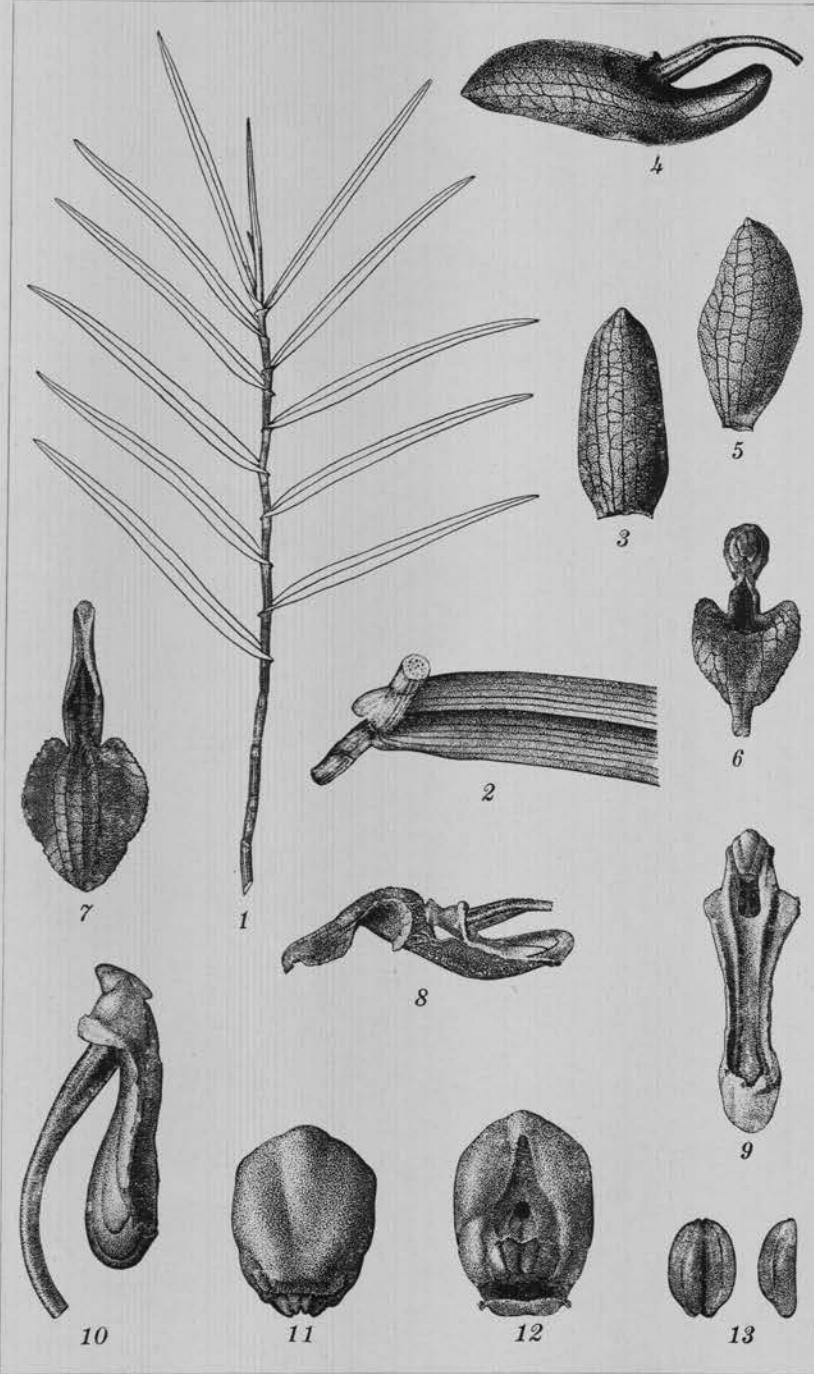


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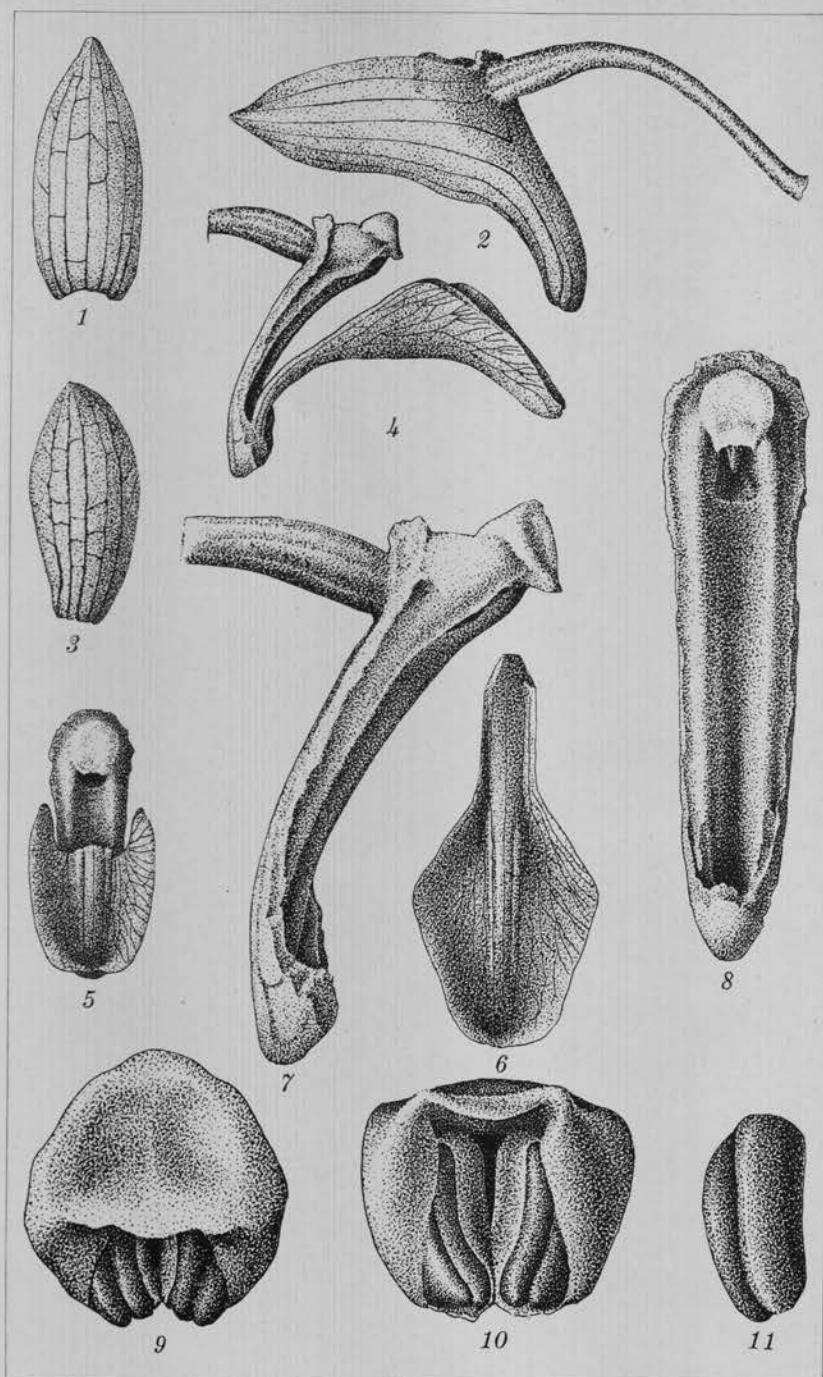


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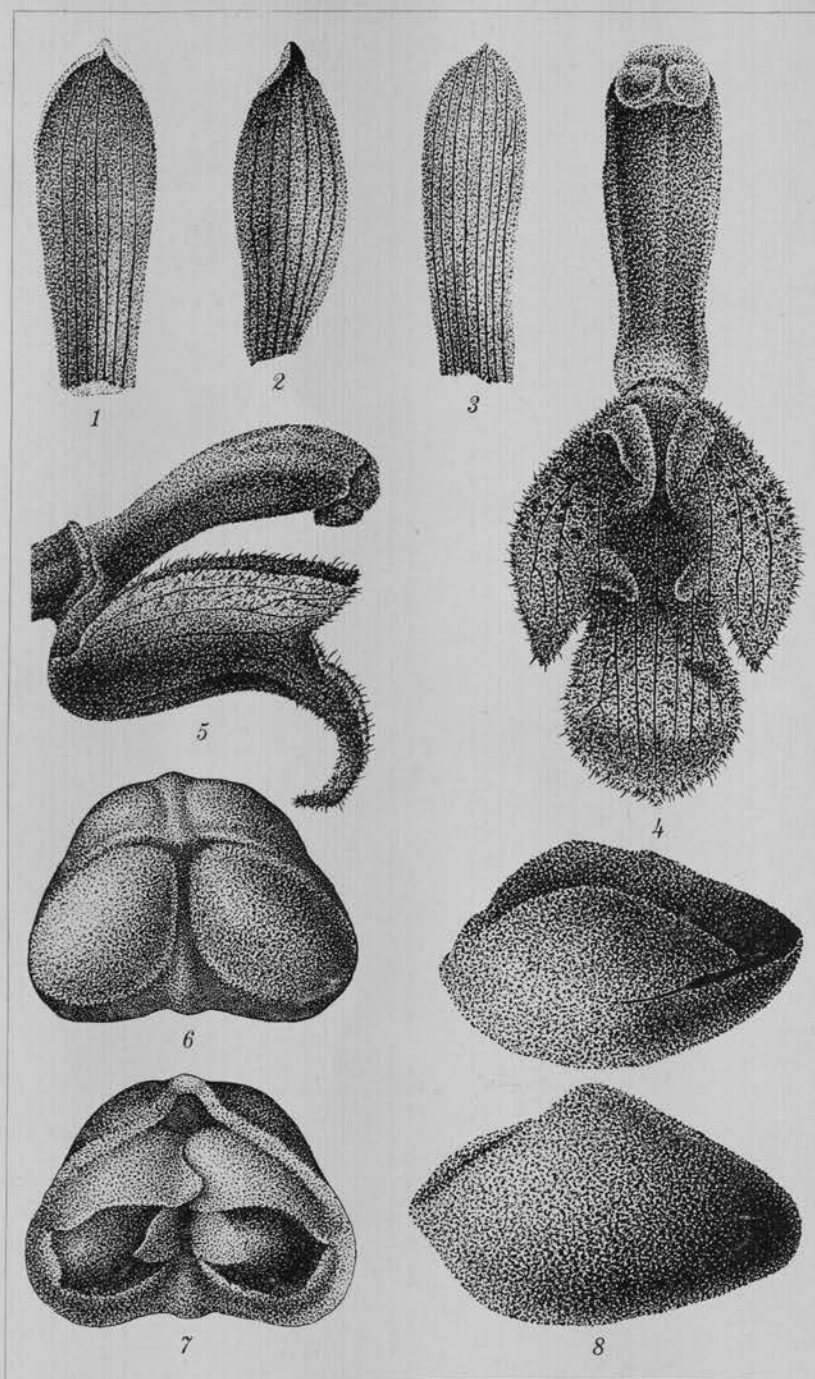


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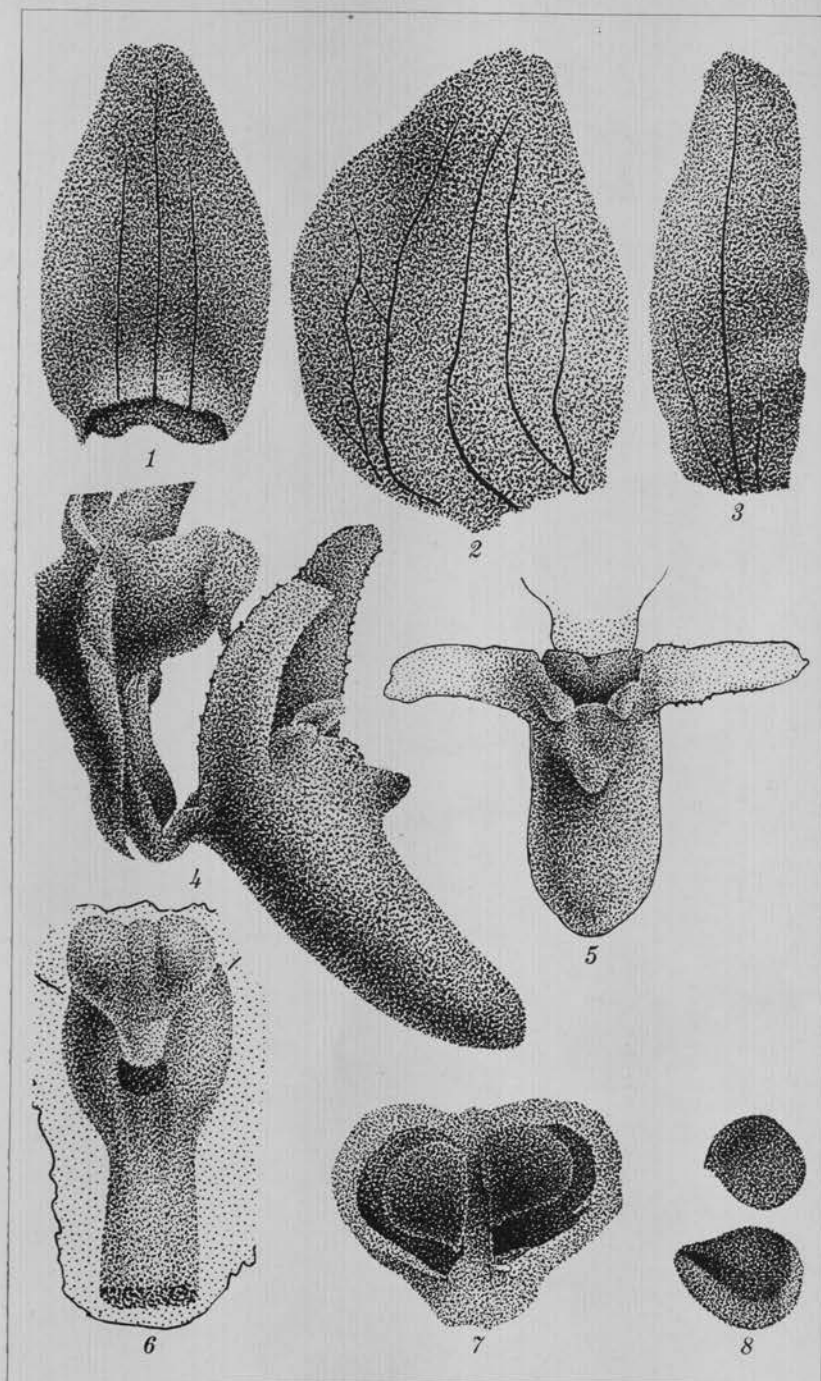


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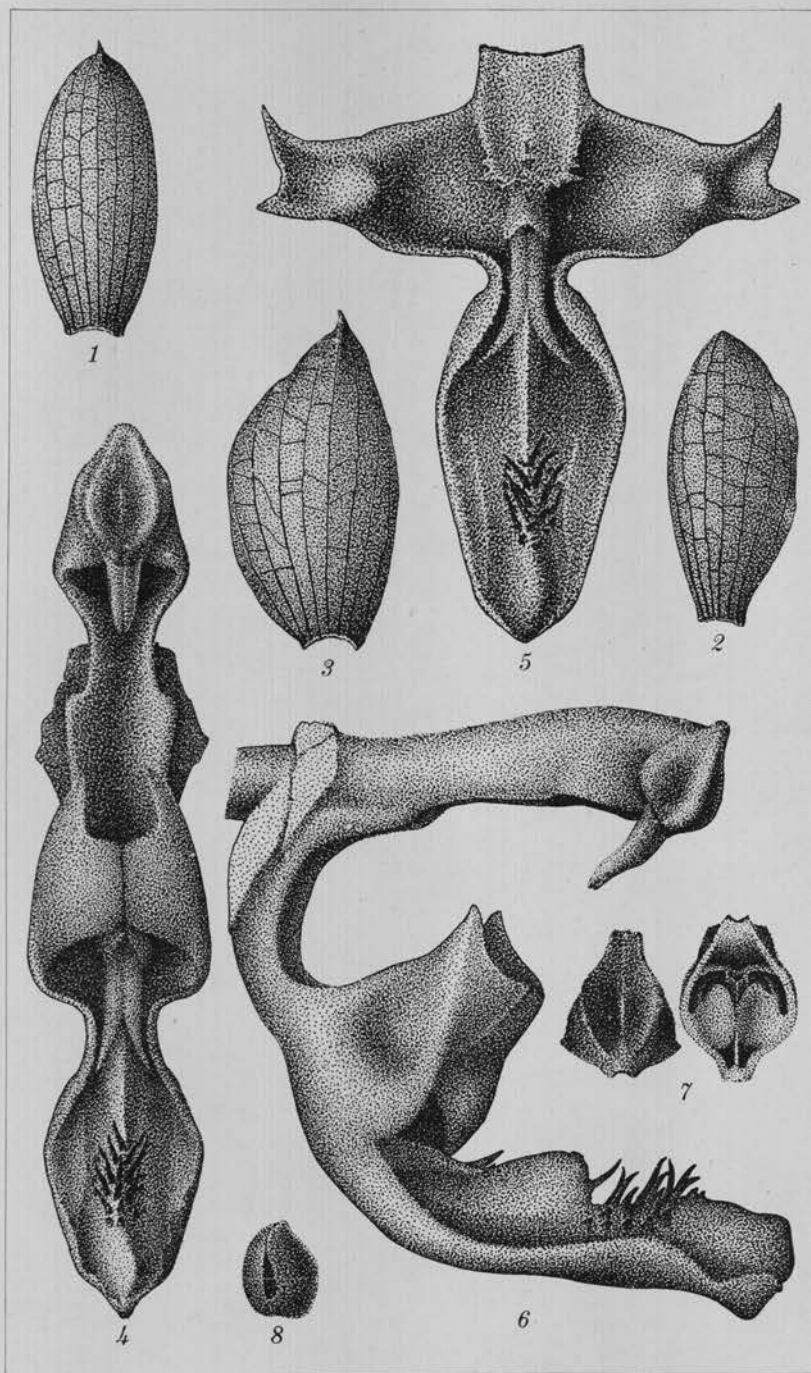


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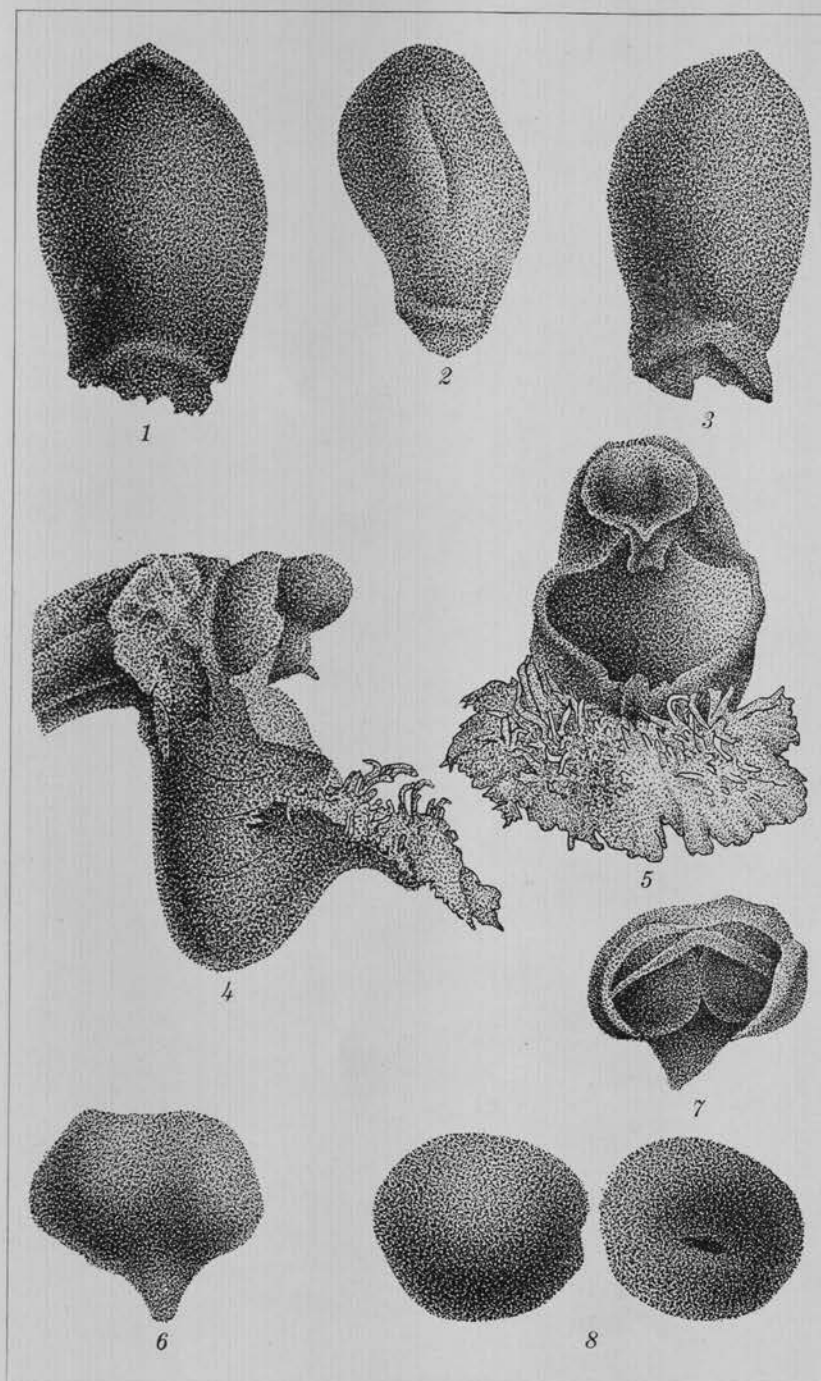


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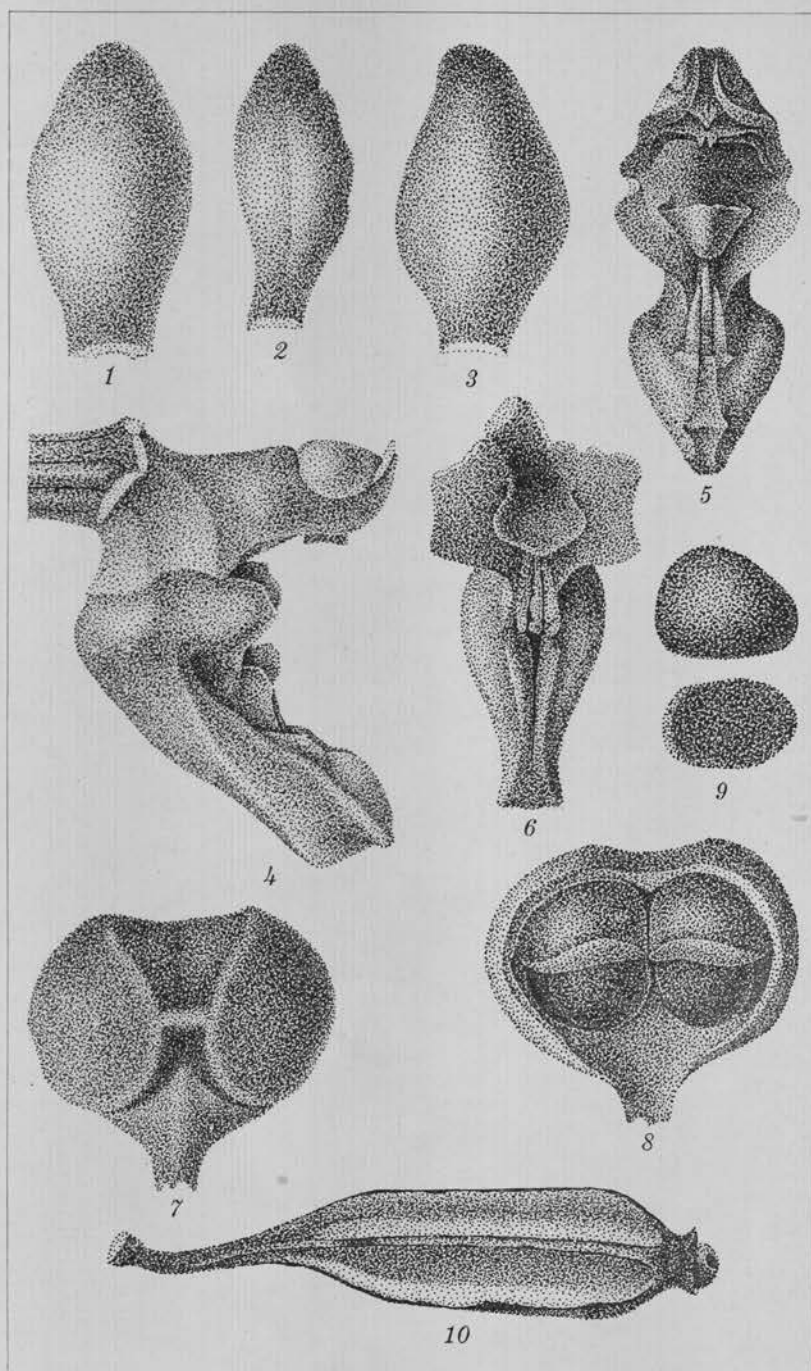


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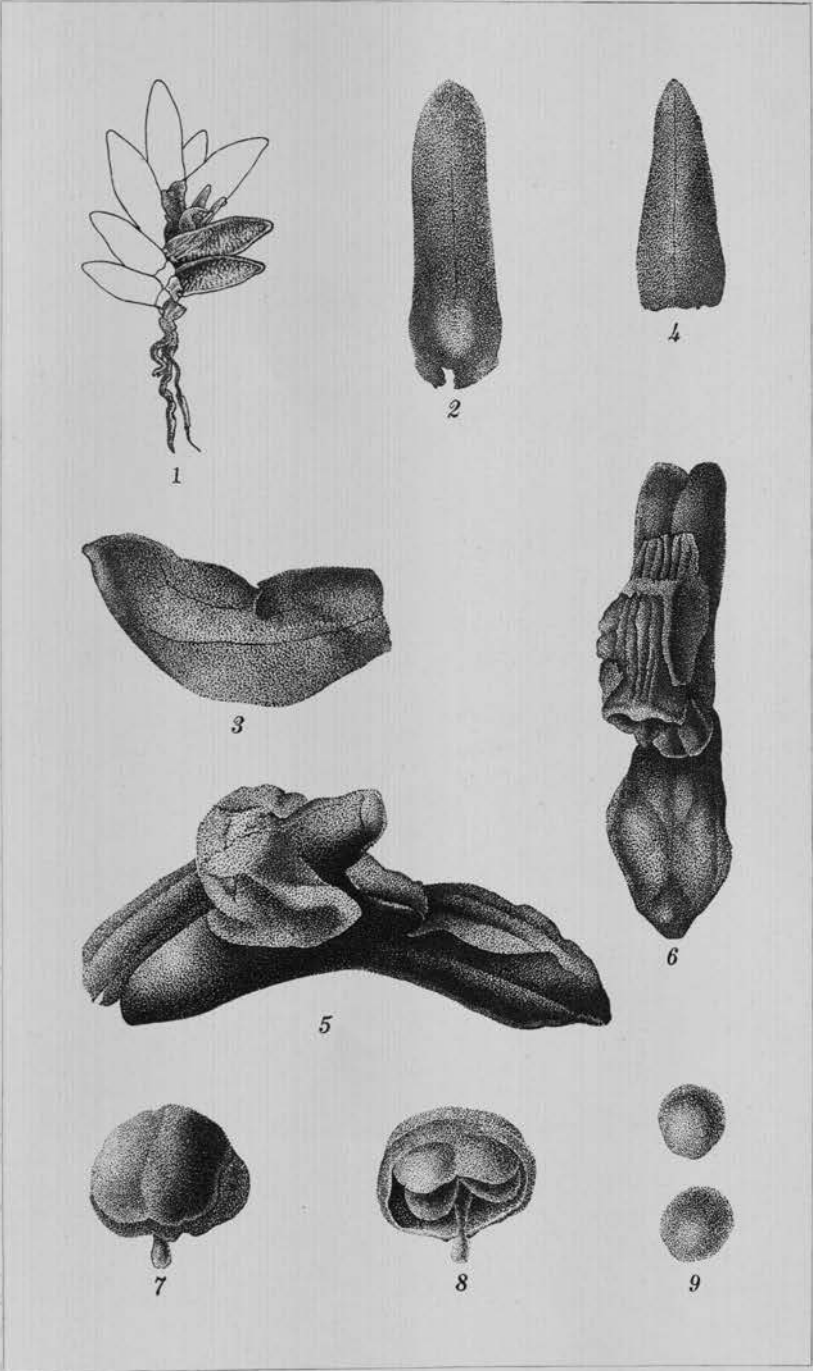


PLATE 13.



PLATE 14.



PLATE 15.



PLATE 16.



PLATE 17.



PLATE 18.

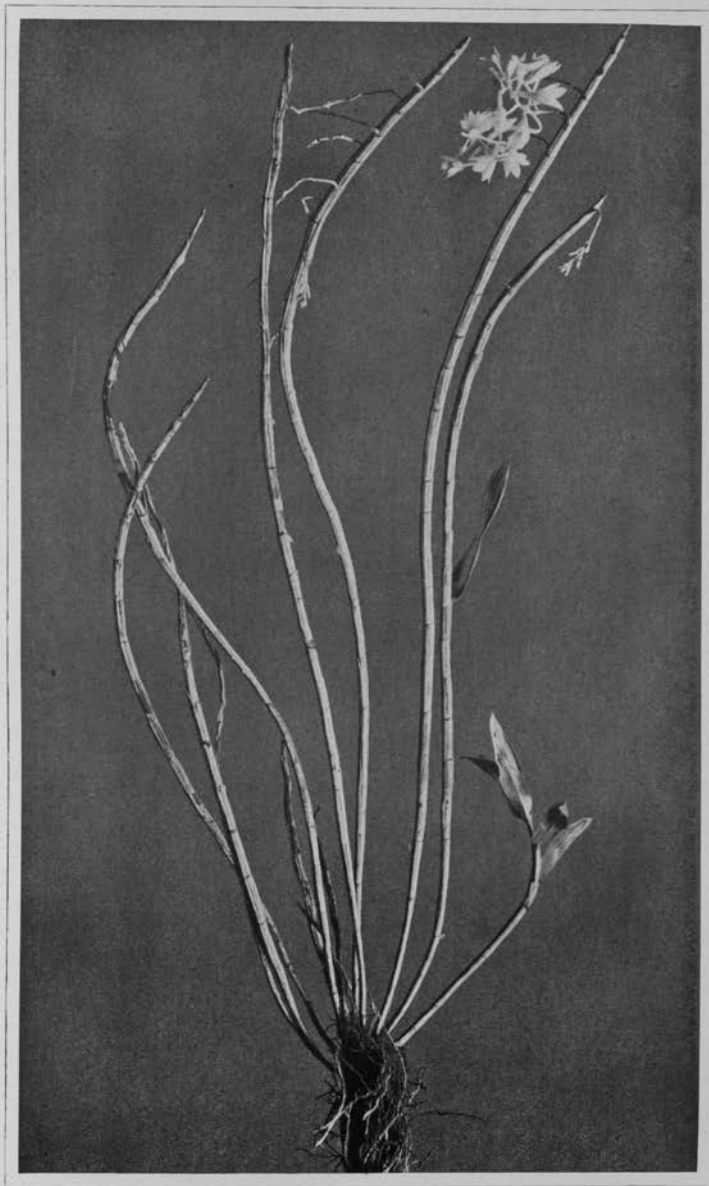


PLATE 19.



PLATE 20.

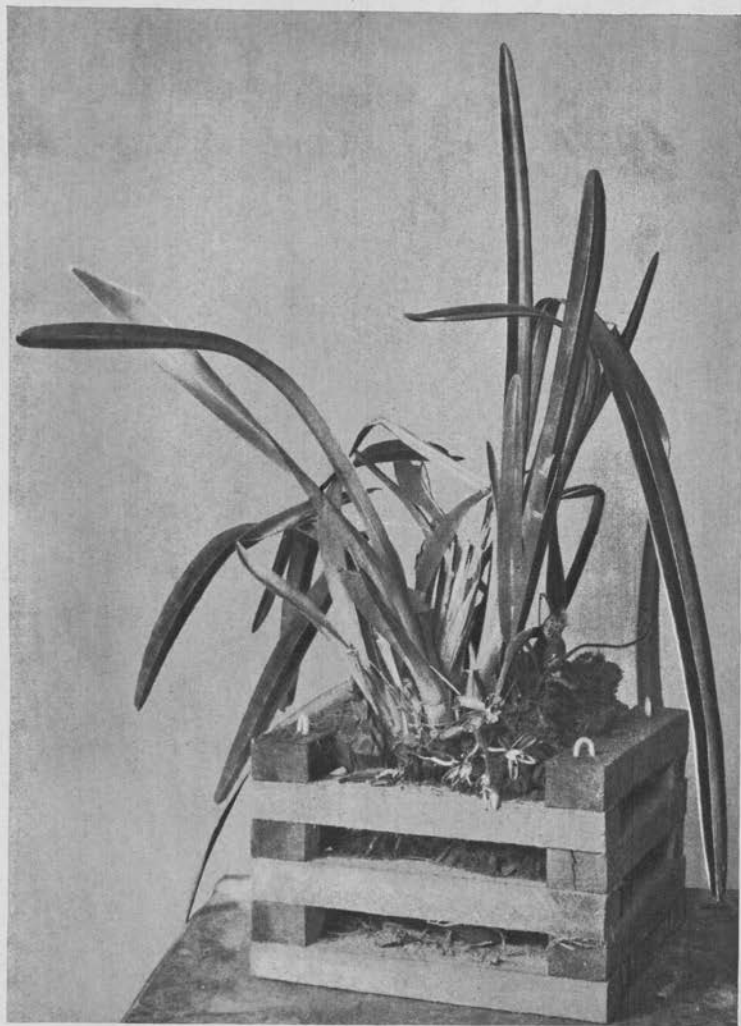


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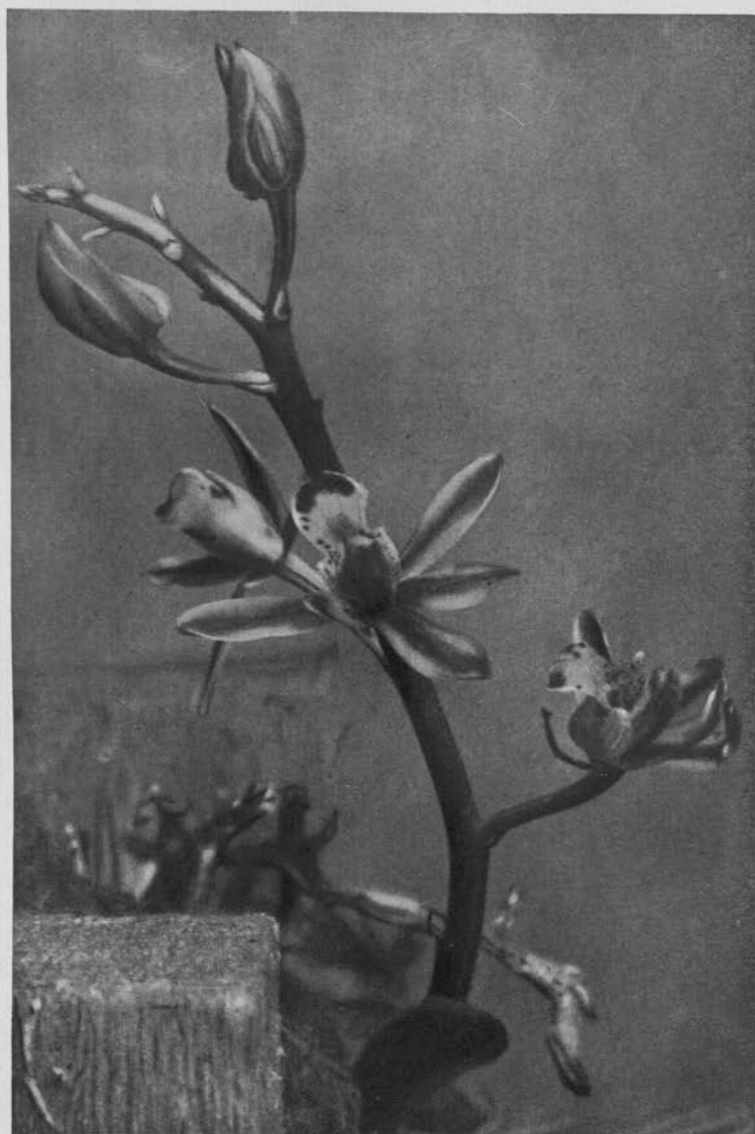


PLATE 22.



PLATE 23.

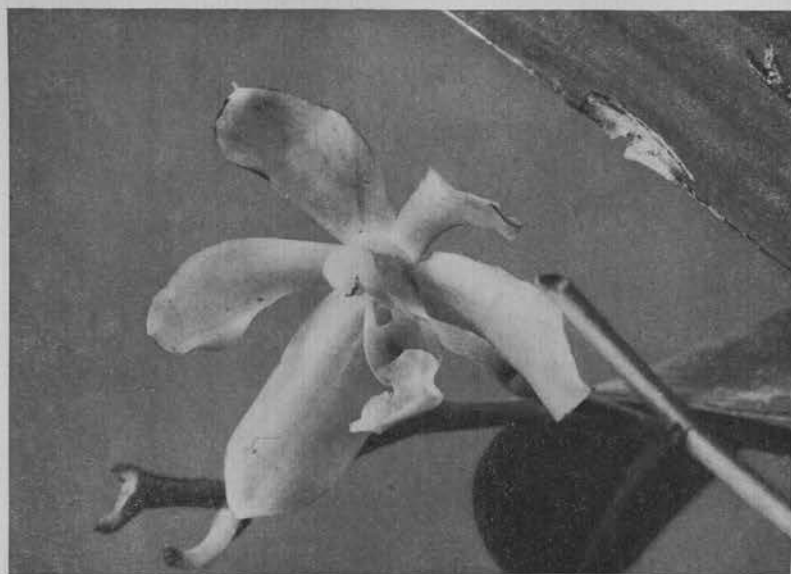
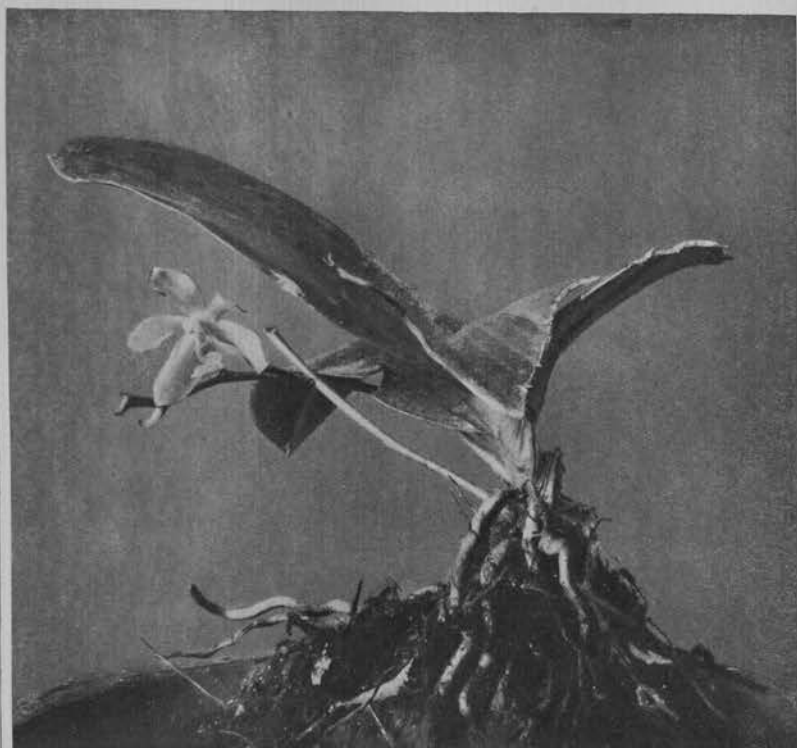


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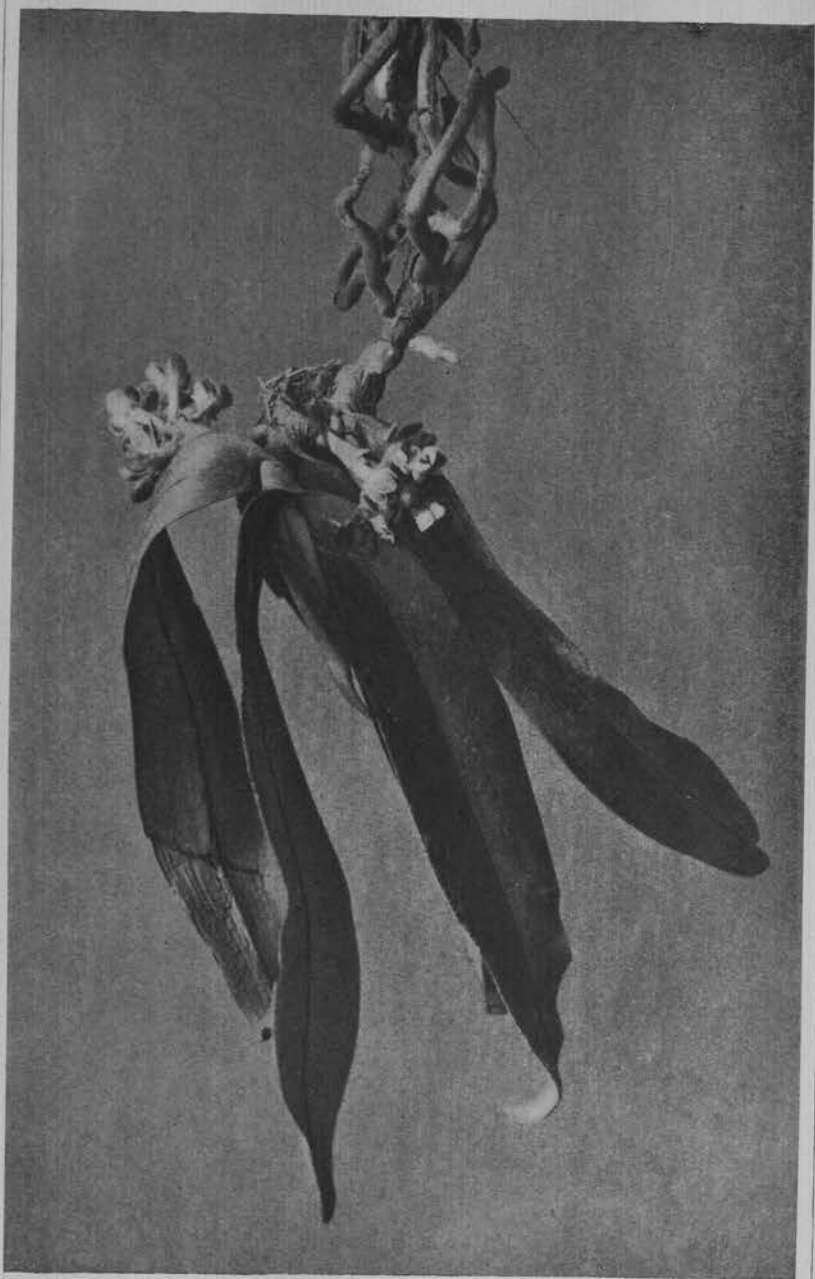


PLATE 25.



PLATE 26.

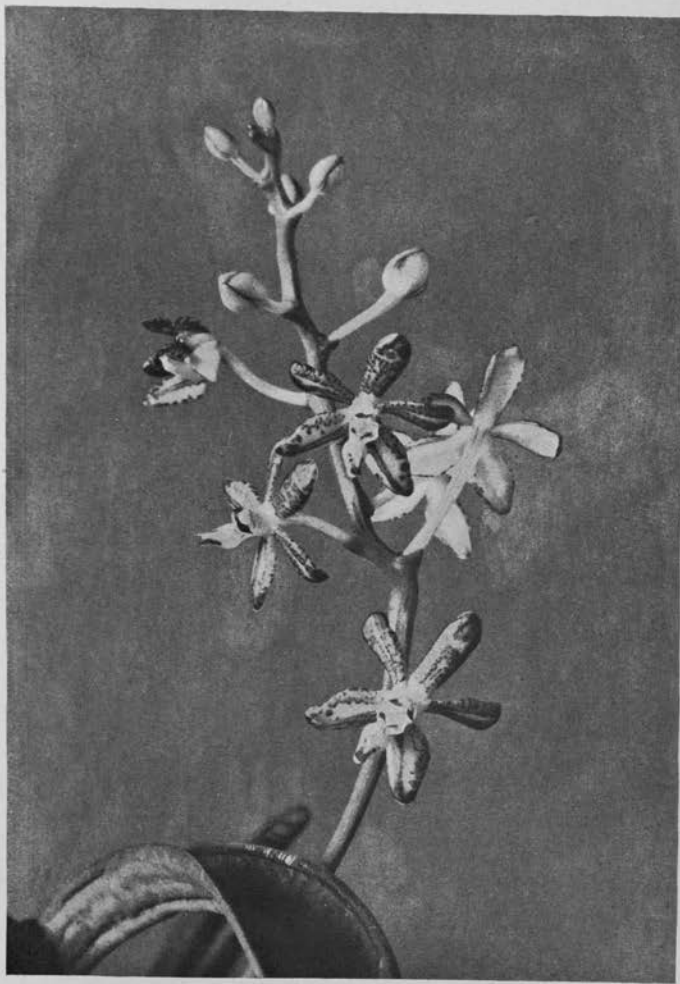


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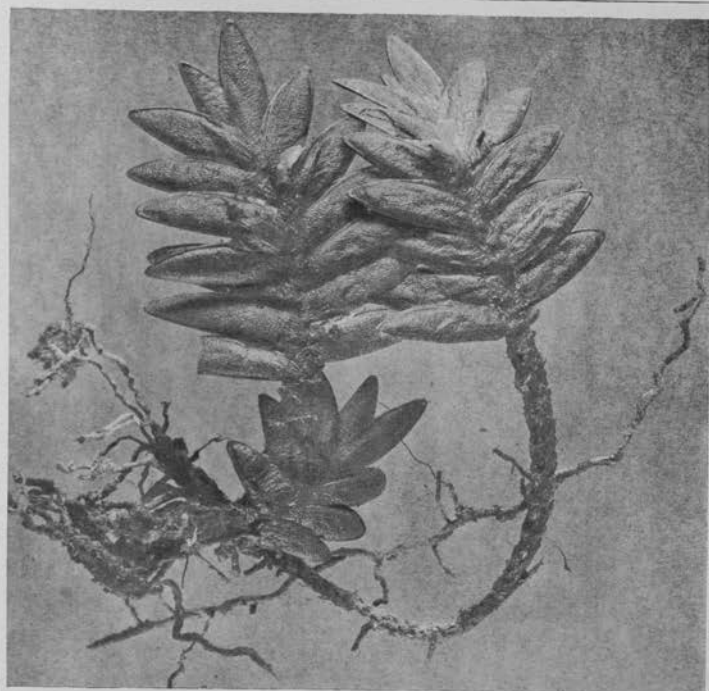


PLATE 28.